EPA/ROD/R04-89/048
1989

EPA Superfund
Record of Decision:

CAPE FEAR WOOD PRESERVING
EPA ID: NCD003188828
OU 01
FAYETTEVILLE, NC
06/30/1989

- REMOVAL OF CREOSOTE SLUDGE FROM THE CREOSOTE CONCRETE SUMP;
- REMOVAL OF SLUDGE FROM THE LAGOON TO A DEPTH OF 7 FEET, AND SOLIDIFICATION OF THE SLUDGE WITH FLY ASH;
- PUMPAGE OF LAGOON WATER INTO STORAGE TANKS LOCATED SOUTH OF THE NEW CCA UNIT;
- REMOVAL OF CONTAMINATED SOIL FROM THE DRAINAGE DITCH THAT PARALLELS THE RAILROAD TRACKS AND AT THE CULVERT NEAR REILLY ROAD;
- REMOVAL OF CONTAMINATED SOILS FROM A PORTION OF THE NORTHEAST SWAMP AND STAINED AREAS IN THE TREATMENT YARD; AND
- BACK FILLING WITH CLEAN SANDY SOIL OF AREAS WHERE CONTAMINATED SOIL HAD BEEN REMOVED.

ALL CONTAMINATED SOILS AND SLUDGES REMOVED WERE TRANSPORTED TO THE GSX HAZARDOUS WASTE LANDFILL IN PINEWOOD, SOUTH CAROLINA.

THE NUS CORPORATION CONDUCTED AN INVESTIGATING OF THE SITE IN MAY AND OCTOBER 1985. SOIL, SEDIMENT, SURFACE WATER AND GROUND WATER SAMPLES WERE COLLECTED. ANALYTICAL RESULTS AGAIN SHOWED THAT SAMPLES WERE CONTAMINATED WITH CREOSOTE-RELATED COMPOUNDS, ARSENIC, CHROMIUM AND COPPER.

EPA CONDUCTED A SECOND EMERGENCY RESPONSE IN SEPTEMBER 1986 WHEN SITE VISITS REVEALED THAT VANDALS HAD SHOT HOLES IN A 3,000-GALLON CREOSOTE STORAGE TANK SPILLING APPROXIMATELY 600 GALLONS OF CREOSOTE ON THE GROUND. THE CLEANUP OPERATION CONSISTED OF:

- REMOVAL, SOLIDIFICATION, AND TRANSPORT OF APPROXIMATELY 10 CUBIC YARDS OF CREOSOTE-CONTAMINATED SLUDGE TO AN ON-SITE METAL SHED EAST OF THE NEW CCA UNIT;
- REMOVAL AND TRANSPORT OF THE CREOSOTE STORAGE TANK TO THE ON-SITE METAL SHED;
- EXCAVATION AND GRADING OF THE AREA WHERE THE CREOSOTE TANK HAD LEAKED;
- PUMPAGE OF APPROXIMATELY 15,000 GALLONS OF CCA WASTE WATER FROM THE CCA RECOVERY SUMP INTO ON-SITE STORAGE TANKS LOCATED SOUTH OF THE NEW CCA UNIT; AND
- CONTAINMENT OF THE CCA RECOVERY SUMP WITHIN AN EARTHEN DIKE.

#EA

2.0 ENFORCEMENT ANALYSIS

SEVERAL POTENTIALLY RESPONSIBLE PARTIES (PRPS) HAVE BEEN IDENTIFIED, INCLUDING THE CAPE FEAR WOOD PRESERVING COMPANY (NO LONGER ACTIVE), JOHNSON & GEDDES CONSTRUCTION COMPANY (NO LONGER ACTIVE), JOHN R. JOHNSON, DORETTA IVEY (WIFE OF FORMER PRESIDENT OF THE CAPE FEAR WOOD PRESERVING COMPANY -- DECEASED), AND DEWEY IVEY, JR. (SON OF THE FORMER PRESIDENT -- DECEASED). RECENTLY IDENTIFIED PRPS INCLUDE SECO INVESTMENTS, INC. (SECO), SOUTHEASTERN CONCRETE PRODUCTS, INC. (SE-LUM), SOUTHEASTERN CONCRETE PRODUCTS OF FAYETTEVILLE, INC. (SE-FAY), MR. STEVE FLOYD, MR. LOUIS LINDSEY, AND MR. JAMES MUSSELWHITE.

IN DECEMBER 1984, EPA ISSUED NOTICE LETTERS TO THE PRPS INFORMING THEM OF EPA'S INTENTION TO CONDUCT CERCLA REMEDIAL ACTIVITIES AT THE SITE UNLESS THE PRPS CHOSE TO CONDUCT SUCH ACTIONS THEMSELVES. THE PRPS WERE SENT NOTICE LETTERS RATHER THAN AN ADMINISTRATIVE ORDER BECAUSE OF THEIR PRESUMED INABILITY TO PAY FOR REMEDIAL ACTION. ON JUNE 5, 1989, THESE PRPS WERE SENT

RD/RA NOTICE LETTERS INFORMING THEM THAT THE AGENCY WAS CONSIDERING SPENDING FUND MONIES IF THEY DO NOT OR ARE INCAPABLE OF CONDUCTING THE PROJECT THEMSELVES.

#CSS

3.0 CURRENT SITE STATUS

THE SITE WAS ABANDONED FROM 1983 UNTIL THE SUMMER OF 1988 WHEN IT WAS PURCHASED BY SECO, INVESTMENTS, INC. PRESENTLY, AN AREA OF APPROXIMATELY 10,000 SQUARE FEET OF THE SITE NEAR THE RAILROAD TRACKS HAS BEEN ENCLOSED BY A CHAINED LINKED FENCE. WITHIN THE FENCE ARE SOME SMALL EARTH-MOVING EQUIPMENT AND A CONCRETE PAD WITH A STORAGE TRAILER ON TOP. THIS AREA IS RENTED TO SOUTHERN CONCRETE PRODUCTS, INC.

IN THE FALL OF 1988 AND AT THE DIRECTION OF A CUMBERLAND COUNTY BUILDING/CONSTRUCTION INSPECTOR, THE OWNER RETRENCHED THE MAJORITY OF THE DRAINAGE DITCH, DUG SEVERAL NEW DRAINAGE TRENCHES AND BREACHED THE DIKED POND. BOTH THE DRAINAGE DITCH AND THE SEDIMENTS WITHIN THE DRAINAGE DITCH AND THE DIKED POND AND THE SEDIMENTS WITHIN THE DIKED POND WERE AREAS TARGETED FOR REMEDIATION.

3.1 HYDROGEOLOGIC SETTING

THE STUDY AREA IS UNDERLAIN BY TWO MAJOR STRATIGRAPHIC FORMATIONS: THE TUSCALOOSA AND THE BLACK CREEK FORMATIONS. THE TUSCALOOSA FORMATION APPEARS TO REST DIRECTLY ON A BASEMENT ROCK COMPLEX AND IS MAINLY A MASSIVE CLAY UNIT CONTAINING INTERBEDDED LAYERS OF SAND. THE BLACK CREEK FORMATION OVERLIES THE TUSCALOOSA FORMATION AND TYPICALLY CONSISTS OF THIN LAYERS OF BROWNISH TO BLACK CLAY ALTERNATING WITH THIN LAYERS OF GRAY TO WHITE FINE-GRAINED QUARTZ SAND. THE CONTACT BETWEEN THE BLACK CREEK BEDS AND THE TUSCALOOSA CLAY IS UNCONFORMABLE. IN ADDITION, THE LITHOLOGY OF THESE FORMATIONS IS SO SIMILAR, IT IS VERY DIFFICULT TO DIFFERENTIATE BETWEEN THE FORMATIONS BASED ON VISUAL INSPECTION.

THE TUSCALOOSA AND BLACK CREEK FORMATIONS ARE OVERLAIN BY UNDIFFERENTIATED SURFICIAL SEDIMENTS. IN THE STUDY AREA, THE SURFICIAL SEDIMENTS HAVE A MAXIMUM THICKNESS OF 30 FEET. THESE BEDS GENERALLY CONSIST OF UNCONSOLIDATED, FINE TO MEDIUM-GRAINED SAND IN A CLAY MATRIX.

GEOLOGIC LOGS RECORDED INDICATE THAT THE SITE IS UNDERLAIN BY INTERMITTENT BEDS OF SANDS, CLAYS, AND SANDS IN CLAY MATRICES. ONE DISTINCT CLAY TO SILTY, SANDY CLAY SEMI-CONFINING UNIT, HOWEVER, WAS IDENTIFIED. THIS UNIT DIVIDES THE SUBSURFACE DOWN TO A DEPTH OF APPROXIMATELY 90 FEET INTO TWO WATER PRODUCING ZONES.

THE UPPER AQUIFER CONSISTS OF UNCONSOLIDATED SANDS AND CLAYS AND IS APPROXIMATELY 25 FEET THICK. THE LOWER AQUIFER ALSO CONSISTS OF SANDS AND CLAYS AND IS APPROXIMATELY 50 FEET THICK. SEPARATING THE AQUIFERS IS A CLAY TO SILTY, SANDY CLAY SEMI-CONFINING UNIT, APPROXIMATELY 16 FEET THICK, WHICH ACTS AS AN AQUITARD. THIS UNIT IS GENERALLY CONTINUOUS ACROSS THE SITE, BUT WAS REPORTING MISSING IN ONE LOCATION ALONG THE ACCESS ROAD. UNDERLYING THE LOWER AQUIFER IS A STIFF CLAY UNIT OF UNKNOWN THICKNESS, WHICH IS ASSURED TO ACT AS AN AQUICLUDE OR AQUITARD BASED ON PHYSICAL DESCRIPTIONS OF THE MATERIAL. THIS UNIT APPEARS TO BE CONTINUOUS ACROSS THE ENTIRE SITE.

IT HAS BEEN DETERMINED THAT THE GROUNDWATER FLOW IN THE LOWER AQUIFER IS GENERALLY SOUTHWESTWARD AT THE SITE (FIGURE 4) WHILE GROUNDWATER FLOW IN THE UPPER AQUIFER IS RADIAL, MOVING IN ALL DIRECTIONS FROM THE SITE (FIGURE 5). THIS RADIAL FLOW PATTERN IN THE UPPER AQUIFER IS PROBABLY DUE TO A COMBINATION OF TWO GEOLOGIC CONDITIONS.

MOST OF THE STEAMS IN THE STUDY AREA HAVE FLOOD PLAINS. SOME HAVE TERRACES THAT RANGE IN WIDTH FROM A FEW FEET TO SEVERAL MILES. ALONG EACH STREAM, THE PRESENT FLOOD PLAIN WIDTH VARIES IN

RESPONSE TO GEOLOGIC CONTROL, BUT THE STREAM, FLOOD PLAIN, TERRACES, AND VALLEYS GENERALLY BECOME WIDER DOWNSTREAM. THE SITE DOES NOT LIE WITHIN A FLOODPLAIN.

- THE SITE IS LOCATED AT A TOPOGRAPHIC HIGH POINT FOR THE AREA AND
- SANDY MATERIALS AT THE SITE FACILITATE HIGHER RAINFALL RECHARGE THAN IN THE SURROUNDING AREAS.

THE SOUTHWESTWARD FLOW PATTERN IN THE LOWER AQUIFER IS PROBABLY IN RESPONSE TO THE REGIONAL FLOW PATTERN FOR THIS AQUIFER.

THE AVERAGE HORIZONTAL GROUNDWATER VELOCITY (BASED ON DARCEY'S LAW FOR GROUNDWATER FLOW) IN THE UPPER AQUIFER IS APPROXIMATELY 9 FEET/YEAR AND FOR THE LOWER AQUIFER, 16 FEET/YEAR. THEREFORE, IN 35 YEARS (THE TIME SINCE THE BEGINNING OF PLANT OPERATIONS), THE MAXIMUM CONTAMINANT MIGRATION IN THE UPPER AQUIFER WOULD BE EXPECTED TO BE IN THE ORDER OF 300 TO 400 FEET FROM THE SOURCE AND 500 TO 600 FEET IN THE LOWER AQUIFER. THE ANALYTICAL DATA BASE SUPPORTS THIS DETERMINATION.

THE AVERAGE VERTICAL GROUNDWATER VELOCITY FROM THE UPPER AQUIFER TO THE LOWER AQUIFER IS ESTIMATED TO BE 3.0 FEET/YEAR.

BOTH AQUIFERS UNDERLYING THE SITE HAVE BEEN CLASSIFIED AS CLASS IIA USING US EPA GROUNDWATER CLASSIFICATION GUIDELINES OF DECEMBER 1986.

3.2 SITE CONTAMINATION

REMEDIAL INVESTIGATION FIELD WORK CENTERED ON THE DEVELOPED AREA OF THE SITE, THE SWAMPY AREAS NORTHEAST AND SOUTHWEST OF THE DEVELOPED AREA, THE CLEARING EAST OF THE DEVELOPED AREA, AND THE DRAINAGE DITCH AND DIKED POND. SOIL, GROUNDWATER, SURFACE WATER AND SEDIMENT SAMPLES WERE COLLECTED IN AND AROUND THESE AREAS. THE SOIL SAMPLES ANALYZED IN THE ON-SITE LABORATORY PROVIDED SUFFICIENT DATA TO DETERMINE HORIZONTAL EXTENT OF CONTAMINATION. THE OTHER ENVIRONMENTAL SAMPLES (WATER AND SEDIMENT) AND 25% OF THE SOIL SAMPLES, WERE SENT TO A LABORATORY IN THE CONTRACT LABORATORY PROGRAM (CLP) AND ANALYZED FOR THE COMPOUNDS ON THE TARGET COMPOUND LIST (TCL) FIVE GROUNDWATER SAMPLES ANALYZED FOR HEXAVALENT CHROMIUM (CR +6) AND FOUR SOIL SAMPLES WERE ANALYZED FOR DIOXINS.

THE MAJOR CONTAMINANTS ARE THE ORGANIC COMPOUNDS (POLYCYCLIC AROMATIC HYDROCARBONS - PAHS) GROUPED UNDER THE GENERAL TERM OF COAL-TAR BASED CREOSOTE AND THE METALS - COPPER, CHROMIUM AND ARSENIC.

3.3 AIR CONTAMINATION

THE MOST COMMON SOURCES OF AIR CONTAMINATION AT HAZARDOUS WASTE SITES ARE THE VOLATILIZATION OF TOXIC ORGANIC CHEMICALS AND THE SPREAD OF AIRBORNE CONTAMINATED DUST PARTICLES. DURING THE RI, SITE PERSONNEL USED THE HNU PHOTOIONIZATION ANALYZER TO MONITOR THE AIR WHILE PERFORMING THE DESIGNATED RI TASKS. NO AIRBORNE PROBLEMS WERE ENCOUNTERED.

3.4 SOIL CONTAMINATION

THE CONCENTRATIONS OF CONTAMINANTS DETECTED IN SOIL AT THE SITE ARE SUMMARIZED IN TABLE 1. THIS TABLE PROVIDES THE FREQUENCY OF DETECTION, THE RANGES OF CONCENTRATIONS FOUND IN SURFICIAL SOIL AT THE SITE, AND THE BACKGROUND CONCENTRATION RANGES FOR THOSE CONTAMINANTS IDENTIFIED AS CHEMICALS OF POTENTIAL CONCERN IN SECTION 2.0 OF THE RISK ASSESSMENT (APPENDIX C OF THE FS). DIOXINS WERE NOT DETECTED IN ANY OF THE FOUR SOIL SAMPLES ANALYZED FOR THIS GROUP OF COMPOUNDS.

ANALYSES OF THE SOIL SAMPLES INDICATE THAT IN SPITE OF PREVIOUS REMOVAL ACTIONS, AREAS WITH HIGH CONCENTRATIONS OF INORGANIC CHEMICALS AND PAHS STILL REMAIN. IN GENERAL THE MOST CONTAMINATED AREAS ARE IN THE PROCESS AREA, THE NORTHEAST SEASONAL SWAMP, ALONG THE ACCESS ROAD TO THE BACK STORAGE AREA, AND ALONG THE DRAINAGE DITCH SOUTHEAST OF THE PROCESS SITE.

FIGURES 6 THROUGH 10 SHOW THE SURFICIAL SOIL ANALYTICAL RESULTS FOR CHROMIUM, ARSENIC, TOTAL PAHS, BENZENE, AND TOLUENE, RESPECTIVELY. THESE CHEMICALS WERE USED EXTENSIVELY IN PAST WOOD PRESERVING OPERATIONS AT THE SITE AND THEREFORE, ARE GOOD INDICATORS OF THE EXTENT OF SITE-RELATED SOIL CONTAMINATION. FIGURES 6 THROUGH 10 ALSO SHOW AREAS OF HIGH AND MODERATE CONTAMINATION COMPARED TO BACKGROUND LEVELS.

AS SHOWN IN FIGURES 6 THROUGH 7, CHROMIUM AND ARSENIC METAL CONTAMINATION IS FOUND MAINLY IN THE CENTRAL PROCESS AREA AND IN THE NORTHEAST SEASONAL SWAMP. SIGNIFICANTLY ELEVATED CONCENTRATIONS WERE ALSO FOUND ALONG THE ACCESS ROAD AND DRAINAGE DITCH. THE HIGHEST CONCENTRATIONS OF CHROMIUM AND ARSENIC (1300 AND 15,000 MG/KG, RESPECTIVELY) WERE ALL FOUND AT GRID POINT C-5 WHICH IS JUST SOUTH OF THE CREOSOTE UNIT.

PAHS ARE MAINLY CONCENTRATED IN THE WESTERN PROCESS AREA AS SHOWN IN FIGURE 8. ISOLATED OCCURRENCES OF HIGH CONCENTRATION WERE ALSO FOUND ALONG THE ACCESS ROAD AND THE DRAINAGE DITCH. THE WESTERN PROCESS AREA WAS HISTORICALLY USED TO UNLOAD THE CREOSOTE FROM THE RAILROAD CARS WHICH MAY EXPLAIN THE HIGH CONCENTRATIONS OF PAHS FOUND IN THIS AREA. THE HIGHEST CONCENTRATION OF TOTAL PAHS (37,000 MG/KG) WAS FOUND AT SS-2 NEAR THE RAILROAD. THE SECOND HIGHEST CONCENTRATION OF TOTAL PAHS (11,000 MG/KG) WAS FOUND AT GRID POINT D-9 WHICH IS LOCATED IN THE BED OF THE DRAINAGE DITCH. THIS SAMPLE IS ESSENTIALLY A SEDIMENT SAMPLE, BUT WAS TAKEN WHEN THE DITCH WAS DRY.

RESULTS OF THE BENZENE AND TOLUENE ANALYSES SHOWN IN FIGURE 9 AND 10, RESPECTIVELY, INDICATE THAT VOLATILE ORGANICS ARE NOT AS WIDESPREAD AT THE SITE AS THE INORGANICS AND PAHS, BUT THEY ARE STILL PREVALENT. OF THE TWO, TOLUENE IS BY FAR THE MORE PREVALENT. TOLUENE IS CONCENTRATED MAINLY IN THE CENTRAL PROCESS AREA AND IN THE NORTHEAST SEASONAL SWAMP. THE HIGHEST CONCENTRATION OF TOLUENE (1100 MG/KG) WAS FOUND AT GRID POINT C-5 WHICH IS JUST SOUTH OF THE CREOSOTE UNIT. BENZENE IS CONCENTRATED MAINLY IN THE SOUTHERN PROCESS AREA WITH THE HIGHEST CONCENTRATION (71 MG/KG) FOUND AT GRID POINT D-8 WHICH IS JUST EAST OF THE METAL SHED. IT IS BELIEVED THAT THE SOURCE OF THE BENZENE CONTAMINATION IS THE UNDERGROUND GASOLINE STORAGE TANK BURIED AT THE WEST END OF THE METAL SHED.

A COMPARISON OF THE INDICATOR CHEMICAL ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED AT THE SURFACE AND AT DEPTH (5 FEET) IS PROVIDED IN TABLE 2. AS SHOWN, THE MAJORITY OF CONTAMINATION IS FOUND AT THE SURFACE, PARTICULARLY AROUND THE PERIMETER OF THE CONTAMINATED AREA. THEREFORE, A SLOPING CONTAMINATED SOIL INTERFACE DOES NOT APPEAR TO BE PREVALENT AND THE RESULTS OF THE SURFICIAL SOIL SAMPLING PROGRAM PROVIDE A VALID DETERMINATION OF THE HORIZONTAL EXTENT OF CONTAMINATION.

A COMPOSITE OF THESE AREAL EXTENTS IS PROVIDED IN FIGURE 11, WHICH SHOWS SURFACE SOIL LOCATIONS EXCEEDING THE CLEANUP GOALS FOR ALL CONTAMINANTS OF CONCERN. THIS AREA ENCOMPASSES APPROXIMATELY 150,000 SQUARE FEET (3.4. ACRES). RESULTS OF THE VERTICAL EXTENT OF CONTAMINATION ANALYSES (BOREHOLE SAMPLES - FIGURE 12) INDICATE THAT ALTHOUGH THE SURFACE IS HIGHLY CONTAMINATED IN SEVERAL AREAS, THE SUBSURFACE BELOW TWO FEET IS GENERALLY UNCONTAMINATED. INDICATOR CHEMICAL ANALYTICAL RESULTS FOR THE BOREHOLE SAMPLES, INCLUDING THE BACKGROUND BOREHOLE, ARE PROVIDED IN TABLE 3. THE ONLY SIGNIFICANT CONTAMINATION ABOVE BACKGROUND AT DEPTH IS THE PAH CONTAMINATION FOUND IN BH-1 AND BH-2. MODERATE CONCENTRATIONS OF PAHS WERE FOUND DOWN TO A DEPTH OF APPROXIMATELY 23 FEET IN BH-1 AND 46 FEET IN BH-2. BH-1 IS LOCATED IN THE AREA OF THE CREOSOTE UNLOADING ZONE, AND BH-2 IS LOOATED IN THE AREA OF THE CREOSOTE UNIT.

SINCE CONTAMINATED SOILS FROM THE SITE WERE LAND FARMED ON PROPERTY OWNED BY GRACE PARKER, SAMPLES WERE COLLECTED HERE TO INSURE THAT A HEALTH RISK DID NOT EXIST DUE THESE PAST DISPOSAL ACTIONS. THE GRACE PARKER PROPERTY ANALYTICAL RESULTS FOR THE CHEMICALS OF POTENTIAL CONCERN ARE SHOWN IN TABLE 4. AS SHOWN, THE GRACE PARKER PROPERTY HAS BEEN CONTAMINATED WITH LOW LEVELS OF PAHS.

3.5 GROUNDWATER CONTAMINATION

FIGURE 13 LOCATES THE INSTALLED MONITORING WELLS THAT PROVIDED THE GROUNDWATER SAMPLES AND TABLE 5 SUMMARIZES THE CONCENTRATIONS OF CONTAMINANTS DETECTED IN GROUNDWATER THAT WERE IDENTIFIED AS CHEMICALS OF POTENTIAL CONCERN IN THE RISK ASSESSMENT (APPENDIX C, SECTION 2.O OF THE FS DOCUMENT). THE COMPLETE ANALYTICAL RESULTS CAN BE SEEN IN APPENDIX A OF THE RI REPORT.

IN GENERAL, ANALYSES OF THE GROUNDWATER SAMPLES INDICATE LOW-LEVEL CONTAMINATION BY A VARIETY OF INORGANIC AND ORGANIC CHEMICALS INCLUDING SEVERAL PAHS. THE ORGANIC CHEMICALS, HOWEVER, ARE THE ONLY CHEMICALS WHICH INDICATE ANY KIND OF PLUME PATTERN OR AREA OF CONTAMINATION WHICH CAN BE TIED TO THE SITE. THE INORGANIC CHEMICALS DO NOT SHOW ANY KIND OF PATTERN AND IN MOST CASES, HIGHER CONCENTRATIONS ARE FOUND OFF-SITE THAN ON-SITE.

FIGURES 14 THROUGH 17 SHOW THE ANALYTICAL RESULTS OF TOTAL PAHS AND TOTAL BTXS (BENZENE, TOLUENE AND XYLENE) IN BOTH THE UPPER AND LOWER AQUIFERS. THESE CONTAMINANTS ARE KNOWN TO BE SITE-RELATED AND FOR THE MOST PART ARE NOT NATURALLY OCCURRING AND THEREFORE, ARE GOOD INDICATORS OF SITE INDUCED CONTAMINATION. IN ADDITION, BECAUSE BTXS DO NOT GENERALLY BECOME TIED UP IN THE SOIL MATRIX, THEY ARE GOOD INDICATORS OF THE MAXIMUM EXTENT OF CONTAMINATION. AS CAN BE SEEN IN FIGURES 14 THROUGH 17, CONTAMINANT PLUMES HAVE BEEN IDENTIFIED IN BOTH AQUIFERS BASED ON THE ANALYTICAL RESULTS. THE PLUMS IN THE UPPER AQUIFER EXTENDS A FEW HUNDRED FEET IN ALL DIRECTIONS AROUND THE WOOD PRESERVING PROCESS AREA. THE PLUME IN THE LOWER AQUIFER COVERS ONLY A SMALL PORTION OF THE PROCESS AREA AND IS LOCATED AROUND WELL EW-01. THE PLUME IN THIS AQUIFER COULD BE THE RESULT OF CONTAMINANTS MIGRATING THROUGH THE SEMI-CONFINING UNIT, BUT IS MORE LIKELY DUE TO POOR CONSTRUCTION OF WELL EW-01 (AN OLD INDUSTRIAL WATER SUPPLY WELL) PROVIDING THE CONDUIT FOR MIGRATION. WELL EW-01 IS SCREENED IN THE LOWER PART OF THE LOWER AQUIFER. IF CONTAMINANTS WERE MIGRATING THROUGH THE SEMI-CONFINING UNIT TO THE DEPTH OF EW-01, A GREATER EXTENT OF CONTAMINATION WOULD BE EXPECTED IN THE GROUNDWATER, AT LEAST OUT TO MW-6. SINCE MW-6 IS LOCATED DOWNGRADIENT OF EW-01 AND IN THE MIDDLE OF THE PROCESSING AREA WITH THE SCREEN IN THE UPPER PART OF THE LOWER AQUIFER, IF CONTAMINATION WAS MIGRATING THROUGH THE SEMI-CONFINING LAYER, THEN IT WOULD BE SEEN IN MW-6.

THE PLUME IN THE UPPER AQUIFER IS CONSISTENT WITH THE RESULTS OF THE HYDROGEOLOGICAL ANALYSIS. THE PLUME IN THE LOWER AQUIFER, HOWEVER, IS NOT CONSISTENT WITH THE HYDROGEOLOGIC ANALYSIS RESULTS. CONTAMINANTS DO NOT APPEAR TO BE MIGRATING THROUGH THE SEMI-CONFINING UNIT INTO THE LOWER AQUIFER INDICATING THAT CONTAMINANTS ARE PROBABLY NOT MOVING VERTICALLY AS GROUNDWATER MOVES. RETARDATION AND/OR DECAY PROCESSES IN THE UPPER AQUIFER AND SEMI-CONFINING UNIT HAVE MOST LIKELY KEPT THE CONTAMINANTS FROM ENTERING THE LOWER AQUIFER, TO ANY SIGNIFICANT DEGREE.

FIGURES 18 THROUGH 21 SHOW THE ANALYTICAL RESULTS FOR CHROMIUM AND ARSENIC IN BOTH THE UPPER AND LOWER AQUIFERS. THESE CONTAMINANTS ARE ALSO KNOWN TO BE SITE-RELATED AND THEREFORE COULD BE INDICATORS OF SITE INDUCED CONTAMINATION. AS CAN BE SEEN IN FIGURES 18 THROUGH 21, HOWEVER, THE ANALYTICAL RESULTS FOR THESE INORGANIC CHEMICALS DO NOT SHOW ANY KIND OF PLUME PATTERN WHICH CAN TIE THE INORGANIC CONTAMINATION TO THE SITE.

THE INORGANIC CONTAMINATION FOUND IN THE STUDY AREA LIKELY EXISTS FOR ONE OF TWO REASONS:

- NATURALLY OCCURRING CONDITIONS OR

- SMALL, LOCAL SOURCES OF CONTAMINATION.

ALL THE INORGANIC CHEMICALS LISTED IN TABLE 5 ARE NATURALLY OCCURRING IN THE SOILS OF THE STUDY AREA, AND GIVEN THE LOW PH OF GROUNDWATER, MOST OF THE CONCENTRATIONS MEASURED FOR THESE CHEMICALS ARE PROBABLY WITHIN THE NATURAL VARIATION OF CONCENTRATIONS EXPECTED. THIS IS ESPECIALLY TRUE CONSIDERING THAT THE SAMPLES ARE NOT FILTERED BEFORE BEING ANALYZED. THREE WELLS, HOWEVER, APPEAR TO HAVE AN UNUSUALLY HIGH CONCENTRATION OF ONE PARTICULAR ELEMENT. THESE WELLS INCLUDE MWS-1, MWS-9 AND DW-14 WHICH ARE FAR FROM THE SITE. BOTH WELLS MWS-1 AND MWS-9 HAVE UNUSUALLY HIGH CONCENTRATIONS OF CHROMIUM, WHILE WELL DW-14 HAS AN UNUSUALLY HIGH COPPER CONCENTRATION. THESE WELLS HAVE NOT EXHIBITED ANY CONTAMINATION IN THE PAST.

OF THE FIVE WELLS SAMPLED AND ANALYZED FOR HEXAVALENT CHROMIUM (CR+6), ONLY ONE SHOWED EVIDENCE OF (CR+6). WELL EW-02 HAD A CONCENTRATION OF 16 UG/L. THE OTHER FOUR WERE BELOW DETECTION LIMITS.

3.6 SURFACE WATER AND SEDIMENT

THE CONCENTRATIONS OF CONTAMINANTS DETECTED IN SURFACE WATER AND SEDIMENT SAMPLES (SAMPLING LOCATIONS SHOWN IN FIGURE 22) ARE SUMMARIZED IN TABLES 6 AND 7, RESPECTIVELY. THE TABLES PRESENT THE ANALYTICAL RESULTS FOR THOSE CHEMICALS IDENTIFIED AS CHEMICALS OF POTENTIAL CONCERN IN SECTION 2.0 OF THE RISK ASSESSMENT (APPENDIX C, SECTION 2.0 OF THE FS DOCUMENT). THE COMPLETE ANALYTICAL RESULTS CAN BE SEEN IN APPENDIX A OF THE RI REPORT).

ALTHOUGH SW-2/SD-2 SAMPLES WERE INTENDED TO BE BACKGROUND SAMPLES, THE ANALYTICAL RESULTS INDICATE OTHERWISE. HIGHLY ELEVATED LEVELS OF SOME INORGANIC CHEMICALS AND THE DETECTION OF PAHS, PARTICULARLY IN THE SEDIMENT SAMPLE, INDICATE THAT THIS SURFACE WATER HAS BEEN INFLUENCED BY SOME SOURCE OF CONTAMINATION. IT IS VERY UNLIKELY THE SOURCE OF THIS CONTAMINATION IS SITE-RELATED SINCE THE SW-2/SD-2 SAMPLING POINT IS APPROXIMATELY A QUARTER OF A MILE FROM THE SITE. BECAUSE OF THE UNCERTAINTY ASSOCIATED WITH THESE SAMPLES, HOWEVER, THE ANALYTICAL RESULTS WERE DROPPED FROM CONSIDERATION AS REPRESENTING BACKGROUND CONCENTRATIONS.

IN GENERAL, ANALYSES OF THE SURFACE WATER AND SEDIMENT SAMPLES INDICATE CONTAMINATION BY PAHS AND A FEW INORGANIC CHEMICALS. THE GREATEST CONCERNS LIE WITH THE DRAINAGE DITCH AND DIKED POND TO THE SOUTH, AND THE SEASONAL SWAMP TO THE NORTHEAST WHERE ELEVATED LEVELS OF ALUMINUM, ARSENIC, CHROMIUM, COPPER, IRON AND PAHS WERE FOUND. ELEVATED LEVELS OF THESE CONTAMINANTS WERE ALSO FOUND IN THE FORMER WATER SUPPLY POND, THE DRAINAGE DITCH TO THE WEST AND THE CONCRETE PLANT DISCHARGE POND TO THE SOUTHEAST, BUT CONTAMINATION IN THESE SURFACE WATER FEATURES IS NOT AS SIGNIFICANT.

THE ELEVATED LEVELS OF ARSENIC, CHROMIUM, COPPER AND PAHS FOUND IN THE SURFACE WATER AND SEDIMENT SAMPLES TAKEN NEAR THE SITE ARE MOST LIKELY SITE-RELATED SINCE THESE CHEMICALS WERE USED EXTENSIVELY IN PAST WOOD PRESERVING OPERATIONS AT THE SITE. ALUMINUM AND IRON CONTAMINATION, HOWEVER, IS NOT EXPECTED TO BE SITE-RELATED. THE ELEVATED CONCENTRATIONS OF THESE CHEMICALS ARE MOST LIKELY DUE TO NATURAL CONDITIONS AT THE SITE. THESE CHEMICALS ARE TYPICAL COMPONENTS OF THE SOILS IN THE STUDY AREA AND THE LOW PH OF SURFACE WATER AND GROUNDWATER IN THE AREA IS PROBABLY CAUSING THEM TO LEACH FROM THE SOILS INTO THE WATER SYSTEM WHERE THEY CAN BE EASILY TRANSPORTED. FIELD MEASUREMENTS OF PH OF NATURAL WATERS AT THE SITE RANGED FROM 3.7 TO 7.9 AND AVERAGED 5.3.

3.7 RISK ASSESSMENT SUMMARY

THE CHEMICALS OF POTENTIAL CONCERN IDENTIFIED FOR THE SITE ARE INORGANIC COMPOUNDS, POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) AND BENZENE. THE INORGANIC COMPOUNDS INCLUDE CHROMIUM AND ARSENIC.

DUE TO THE UNCERTAINTY OF LAND USE IN AND AROUND THE SITE, SEVERAL DIFFERENT LAND USE SCENARIOS WERE EVALUATED. THE EXPOSURE PATHWAYS IDENTIFIED UNDER CURRENT LAND USE CONDITIONS (KEEP UNDEVELOPED WITH MINIMAL INDUSTRIALIZATION) ARE THE FOLLOWING:

- DIRECT CONTACT WITH CONTAMINATED SURFACE SOILS BY CHILDREN TRESPASSING ON THE SITE,
- INHALATION OF FUGITIVE DUST ORIGINATING FROM CONTAMINATED SOIL AREAS BY SITE TRESPASSERS AND NEARBY RESIDENTS, AND
- CONTACT WITH CONTAMINATED SEDIMENTS BY CHILDREN WADING ON-SITE IN THE DIKED POND AND DRAINAGE DITCH.

ADDITIONAL HUMAN EXPOSURE PATHWAYS ARE RELEVANT IF THE FUTURE USE OF THE SITE AND SURROUNDING AREA BECOMES EITHER MORE INDUSTRIAL OR RESIDENTIALLY ORIENTED. THESE ADDITIONAL EXPOSURE PATHWAYS ARE:

- DIRECT CONTACT WITH CONTAMINATED SURFACE SOILS BY FUTURE RESIDENTS AND WORKERS,
- INHALATION OF FUGITIVE DUST ORIGINATING FROM CONTAMINATED SOIL AREAS BY FUTURE WORKERS, AND
- INGESTION OF GROUNDWATER FROM THE UPPER AND LOWER AQUIFERS.

BECAUSE "APPLICABLE AND RELEVANT OR APPROPRIATE REQUIREMENTS" (ARARS) ARE NOT AVAILABLE FOR ALL CHEMICALS IN ALL ENVIRONMENTAL MEDIA, RISKS WERE ALSO QUANTITATIVELY ASSESSED FOR THE IDENTIFIED EXPOSURE PATHWAYS. FOR LIFETIME EXPOSURES (70 YEARS), RISKS WERE ESTIMATED ASSUMING EXPOSURE CONCENTRATIONS REMAINED CONSTANT OVER TIME.

ESTIMATES OF RISKS UNDER CURRENT LAND USE CONDITIONS ARE AS FOLLOWS. FOR DIRECT CONTACT WITH SURFACE SOILS FOR CHILDREN TRESPASSING ONSITE, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 1,000,000 UNDER THE AVERAGE CASE AND 1 PERSON OUT OF 200,000 UNDER THE PLAUSIBLE MAXIMUM CASE. RISK UNDER THE PLAUSIBLE MAXIMUM CASE IS DUE TO CARCINOGENIC PAHS. FOR INHALATION OF FUGITIVE DUST BY ONSITE TRESPASSERS, INDIVIDUALS OF THE JACKSON RESIDENCE AND RESIDENCE IN THE SOUTHGATE SUBDIVISION, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 1,000,000 UNDER AVERAGE AND PLAUSIBLE MAXIMUM CASES. FOR CHILDREN WADING IN ONSITE SURFACE WATER AND EXPOSED TO CHEMICALS OF POTENTIAL CONCERN IN SEDIMENTS, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 1,000,000 UNDER AVERAGE CASES AND 1 PERSON OUT OF 100,000 UNDER A PLAUSIBLE MAXIMUM CASE. NO CARCINOGENIC CHEMICALS OF POTENTIAL CONCERN ARE DETECTED IN THE RESIDENTIAL WELLS, THEREFORE INGESTION OF DRINKING WATER BY CURRENT RISK IS LESS THAN 1 PERSON OUT OF 1,000,000.

ESTIMATES OF RISKS UNDER HYPOTHETICAL FUTURE LAND USE CONDITIONS ARE AS FOLLOWS. FOR POTENTIAL EXPOSURE ASSOCIATED WITH DIRECT CONTACT WITH THE SOIL AT THE SITE BY FUTURE RESIDENTS, THE LIFETIME EXCESS UPPER BOUND CONCERN RISK IS 1 PERSON OUT OF 3,000,000 UNDER THE AVERAGE CASE AND 1 PERSON OUT OF 1,000 UNDER THE PLAUSIBLE MAXIMUM CASE. RISKS UNDER BOTH CASES ARE DUE PRIMARILY TO CARCINOGENIC PAHS; UNDER THE PLAUSIBLE MAXIMUM CASE, THE RISK IS DUE TO ARSENIC IS 1 PERSON OUT OF 200,000. FOR DIRECT CONTACT WITH SOILS BY FUTURE WORKERS ONSITE, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 1,000,000 UNDER AVERAGE CASE AND 1 PERSON OUT OF 200,000 UNDER THE PLAUSIBLE MAXIMUM CASE. RISK UNDER THE PLAUSIBLE MAXIMUM CASE IS DUE PRIMARILY TO CARCINOGENIC PAHS; THE RISK FROM ARSENIC UNDER THE PLAUSIBLE MAXIMUM CASE IS 1 PERSON OUT OF 3,000,000. THE RISK ASSOCIATED WITH EXPOSURE TO CHEMICALS AT THE MAXIMUM DETECTED SAMPLE CONCENTRATIONS WOULD RESULT IN LIFETIME EXCESS CANCER RISKS OF 1 PERSON OUT OF 8,000. FOR INHALATION OF FUGITIVE DUST BY FUTURE WORKERS ONSITE, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 1,000,000 UNDER THE AVERAGE AND PLAUSIBLE MAXIMUM

CASES. INGESTION OF GROUNDWATER FROM THE UPPER AQUIFER BY FUTURE RESIDENTS, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS 1 PERSON OUT OF 4,000 UNDER THE AVERAGE CASE AND 1 PERSON OUT OF 6,000 UNDER THE PLAUSIBLE MAXIMUM CASE. AND INGESTION OF GROUNDWATER FROM THE LOWER AQUIFER BY FUTURE RESIDENTS, THE LIFETIME EXCESS UPPER BOUND CANCER RISK IS LESS THAN 1 PERSON OUT OF 20,000 UNDER THE AVERAGE CASE AND 1 PERSON OUT OF 2,000 UNDER THE PLAUSIBLE MAXIMUM CASE.

POTENTIAL ENVIRONMENTAL IMPACTS OF THE CHEMICALS OF POTENTIAL CONCERN AT THE SITE WERE ALSO EVALUATED. PLANT AND ANIMAL SPECIES POTENTIALLY EXPOSED TO THE CHEMICALS OF CONCERN AT THE SITE WERE IDENTIFIED BASED ON A KNOWLEDGE OF THE SITE AND SURROUNDING HABITAT. RISKS WERE ASSESSED BY COMPARING THE REPORTED ENVIRONMENTAL CONCENTRATION OR THE ESTIMATED DOSE WITH THE SELECTED TOXICITY VALUE. ABSOLUTE CONCLUSIONS REGARDING THE POTENTIAL ENVIRONMENTAL IMPACTS AT THE CAPE FEAR SITE CANNOT BE MADE BECAUSE THERE ARE MANY UNCERTAINTIES SURROUNDING THE ESTIMATES OF TOXICITY AND EXPOSURE.

THE MAXIMUM CONCENTRATIONS OF ARSENIC, CHROMIUM, COPPER AND LEAD FOUND IN THE SOILS OF THE SITE EXCEED LEVELS KNOWN TO BE PHYTOTOXIC IN AT LEAST SOME SPECIES. THE GEOMETRIC MEAN CONCENTRATIONS OF ARSENIC AND CHROMIUM IN THE SOILS FROM THE PROCESSING AREA ARE CLOSE TO THE LEVELS TOXIC TO SOME SPECIES AND ARE POSSIBLY AT CONCENTRATIONS THAT ARE TOXIC TO SPECIES WHICH OCCUR IN THE AREA OF THE CAPE FEAR SITE. CONCLUSIONS REGARDING ADVERSE IMPACTS TO PLANTS AT THE SITE ARE SUPPORTED BY THE LACK OF VEGETATION ACROSS LARGE AREAS OF THE SITE. PORTIONS OF THE SITE THAT REMAIN WITHOUT VEGETATION OFFER LITTLE VALUE AS WILDLIFE HABITAT AND THUS, THE HABITAT VALUE OF THE AREA IS REDUCED.

SMALL MAMMALS AND DEER THAT POTENTIALLY USE THE SURFACE WATER OF THE CAPE FEAR SITE AS A DRINKING WATER SOURCE DO NOT APPEAR TO BE AT INCREASED RISK OF ADVERSE IMPACTS, AS THE ESTIMATED INTAKES ARE WELL BELOW THOSE ESTIMATED TO BE ASSOCIATED WITH TOXIC EFFECTS. BIRDS INGESTING WATER FROM THE NORTHEAST SWAMP, DITCH-DIKED POND AREA, AND CONCRETE PLANT DISCHARGE POND MAY BE AT INCREASED RISK OF ADVERSE IMPACT FROM CHROMIUM AS ESTIMATED INTAKES ARE APPROXIMATELY EQUAL TO THE DERIVED TOXICITY VALUE. THIS MAY BE OF PARTICULAR CONCERN FOR RED-COCKADED WOODPECKERS, AN ENDANGERED SPECIES POTENTIALLY OCCURRING IN THE AREA, A LOSS OF EVEN A SINGLE INDIVIDUAL COULD ADVERSELY AFFECT REPRODUCTION (AND THUS, THE POPULATION) OF THIS ALREADY STRESSED SPECIES. THERE ARE, HOWEVER, MANY UNCERTAINTIES SURROUNDING THE DERIVATION OF THE TOXICITY VALUES AND THE ESTIMATED INTAKES AND THEREFORE, ABSOLUTE CONCLUSIONS CANNOT BE MADE.

ADVERSE IMPACTS MAY ALSO BE OCCURRING IN THE SURFACE WATERS OF THE SITE. CONCENTRATIONS OF ARSENIC IN THE NORTHEAST SWAMP AND THE DITCH-DIKED POND AREA EXCEED THE ACUTE AND CHRONIC AMBIENT WATER QUALITY CRITERIA (AWQC) FOR THIS CHEMICAL. CHROMIUM CONCENTRATIONS IN THE NORTHEAST SWAMP, THE DITCH-DIKED POND AREA AND THE CONCRETE PLANT DISCHARGE POND EXCEED THE ACUTE AND CHRONIC AWQC. COPPER CONCENTRATIONS EXCEED THE ACUTE AND CHRONIC CRITERIA IN THE WATER SUPPLY POND, THE NORTHEAST SWAMP, AND THE DITCH-DIKED POND AREA. AQUATIC SPECIES MOST LIKELY IMPACTED ARE INSECTS, OTHER INVERTEBRATES, AND AQUATIC PLANTS. IT IS DIFFICULT TO DETERMINE THE IMPACT OF THESE ADVERSE EFFECTS ON THE AQUATIC POPULATIONS OF THE AREA. HOWEVER, THE OBSERVED LEVELS OF CONTAMINANTS IN SOME OF THE SURFACE WATERS AT THE SITE PROBABLY RESULT IN AN EXCLUSION OF AQUATIC LIFE IN THESE WATERS, OR A SHIFT IN COMMUNITY STRUCTURE TOWARDS SPECIES MORE TOLERANT OF HIGH METAL CONCENTRATIONS.

#CLC

4.0 CLEANUP CRITERIA

THE EXTENT OF CONTAMINATION WAS DEFINED IN SECTION 3.0, CURRENT SITE STATUS. THIS SECTION EXAMINES THE ARARS ASSOCIATED WITH THE CONTAMINANTS FOUND ON SITE AND THE ENVIRONMENTAL MEDIUM CONTAMINATED. IN THE CASES WHERE NO SPECIFIC ARAR CAN BE IDENTIFIED, A DEFENDABLE REMEDIATION GOAL WAS GENERATED. TABLE 8 PROVIDES A SUMMARY OF THE ENVIRONMENTAL MEDIUMS CONTAMINATED, THE CLEAN-UP GOALS FOR THE CONTAMINANTS OF CONCERN IN EACH MEDIUM, AND A RATIONALE FOR EACH

SPECIFIED CLEAN-UP GOAL.

4.1 GROUNDWATER REMEDIATION

IN DETERMINING THE DEGREE OF GROUNDWATER CLEAN-UP, SECTION 121(D) OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA) REQUIRES THAT THE SELECTED REMEDIAL ACTION ESTABLISH A LEVEL OR STANDARD OF CONTROL WHICH COMPLIES WITH ALL ARARS, BE COST-EFFECTIVE AND ACHIEVE A CLEAN-UP LEVEL THAT IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. FINALLY, THE REMEDY SHOULD UTILIZE PERMANENT TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE.

FOR THOSE CONTAMINANTS FOUND IN THE GROUNDWATER AT THE SITE, TABLE 8 PRESENTS THE REMEDIATION LEVELS THE MIGRATION REMEDIAL ALTERNATIVE WILL ACHIEVE, AT A MINIMUM.

4.2 SOIL REMEDIATION

THE PUBLIC HEALTH AND ENVIRONMENTAL ASSESSMENT IN THE RI (CHAPTER 4), DETERMINED THAT RISKS TO HUMAN AS A RESULT OF EXPOSURE TO ON-SITE CONTAMINANTS VIA INHALATION, INGESTION AND DERMAL CONTACT ARE VERY LOW UNDER PRESENT SITE CONDITIONS. FOR POTENTIAL FUTURE USE SCENARIOS, THE RISK IS SLIGHTLY HIGHER. THEREFORE, REMEDIATION AND INSTITUTIONAL CONTROLS WILL BE NECESSARY TO ASSURE THAT AN INCREASED RISK TO HUMAN HEALTH IS NOT POSED IN THE FUTURE.

TABLE 8 PRESENTS CLEAN-UP REMEDIATION LEVELS THAT THE SOURCE REMEDIATION ALTERNATIVE WILL ACHIEVE.

4.3 SURFACE WATER/SEDIMENT REMEDIATION

THE FOLLOWING AREAS HAVE BEEN TARGETED FOR REMEDIATION: THE WATER SUPPLY ROAD, THE NORTHEAST SEASONAL SWAMP, THE DRAINAGE DITCH SOUTH AND WEST OF THE RAILROAD TRACKS, THE DIKED POND AND THE DRAINAGE DITCH. THE LEVEL OF CLEAN-UP FOR THE SURFACE WATERS AND SEDIMENT ARE ALSO STATED IN TABLE 8.

#AE

5.0 ALTERNATIVES EVALUATED

THE PURPOSE OF THE REMEDIAL ACTION AT THE CAPE FEAR SITE IS TO MINIMIZE, IF NOT MITIGATE CONTAMINATION IN THE SOILS, GROUNDWATER, AND SURFACE WATERS AND SEDIMENT AND TO REDUCE, IF NOT ELIMINATE, POTENTIAL RISKS TO HUMAN HEALTH AND THE ENVIRONMENT. THE FOLLOWING CLEAN-UP OBJECTIVES WERE DETERMINED BASED ON REGULATORY REQUIREMENTS AND LEVELS OF CONTAMINATION FOUND AT THE SITE:

- TO PROTECT THE PUBLIC HEALTH AND THE ENVIRONMENT FROM EXPOSURE TO CONTAMINATED ON-SITE SOILS THROUGH INHALATION, DIRECT CONTACT, AND EROSION OF SOILS INTO SURFACE WATERS AND WETLANDS;

- TO PREVENT OFF-SITE MOVEMENT OF CONTAMINATED GROUNDWATER; AND

- TO RESTORE CONTAMINATED GROUNDWATER TO LEVELS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT.

TABLE 9 PROVIDES A LIST OF POSSIBLE REMEDIAL TECHNOLOGIES APPLICABLE AT THE CAPE FEAR SITE KNOWING THE ENVIRONMENTAL MEDIA AFFECTED, THE TYPE OF CONTAMINANTS PRESENT AND THE CONCENTRATION OF EACH CONTAMINANT IN EACH ENVIRONMENTAL MEDIUM. TABLE 10 LISTS THOSE TECHNOLOGIES RETAINED AFTER THE INITIAL SCREENING. THIS INITIAL SCREENING EVALUATES THE TECHNOLOGIES ON THE FOLLOWING TECHNICAL PARAMETERS:

- IMPLEMENTABILITY,
- RELIABILITY AND EFFECTIVENESS, AND
- PREVIOUS EXPERIENCE.

THESE TECHNOLOGIES ADDRESS SOILS/SEDIMENTS, SURFACE WATER AND GROUNDWATER AND THE HAZARDOUS MATERIAL, TANKS AND PIPING AND BEST MEET THE CRITERIA OF SECTION 300.65 OF THE NATIONAL CONTINGENCY PLAN (NCP).

FOLLOWING THE INITIAL SCREENING OF THE INDIVIDUAL TECHNOLOGIES, THESE TECHNOLOGIES WERE COMBINED TO FORM A NUMBER OF REMEDIAL ACTION ALTERNATIVES. THESE ALTERNATIVES ADDRESS THE CONTAMINATED SOILS AND SEDIMENTS, SURFACE WATER AND GROUNDWATER, AND HAZARDOUS MATERIALS, TANKS AND PIPING, AND ARE LISTED IN TABLES 11 THROUGH 13, RESPECTIVELY. THESE REMEDIAL ACTION ALTERNATIVES ARE THAN SCREENED AND ANALYZED IN RELATION TO THE NINE POINT CRITERIA.

5.1 NINE POINT EVALUATION CRITERIA FOR EVALUATING REMEDIAL ACTION ALTERNATIVES

EACH ALTERNATIVE WAS EVALUATED USING A NUMBER OF EVALUATION FACTORS. THE REGULATORY BASIS FOR THESE FACTORS COMES FROM THE NATIONAL CONTINGENCY PLAN (NCP) AND SECTION 121 OF SARA. SECTION 121(B)(1) STATES THAT, "REMEDIAL ACTIONS IN WHICH TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE VOLUME, TOXICITY OR MOBILITY OF THE HAZARDOUS SUBSTANCES, POLLUTANTS AND CONTAMINANTS AS A PRINCIPAL ELEMENT, ARE TO BE PREFERRED OVER REMEDIAL ACTIONS INVOLVING SUCH TREATMENT. THE OFFSITE TRANSPORT AND DISPOSAL OF HAZARDOUS SUBSTANCES OR CONTAMINATED MATERIALS WITHOUT SUCH TREATMENT SHOULD BE THE LEAST FAVORED ALTERNATIVE REMEDIAL ACTION WHERE PRACTICABLE TREATMENT TECHNOLOGIES ARE AVAILABLE."

SECTION 121 OF SARA ALSO REQUIRES THAT THE SELECTED REMEDY BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, COST-EFFECTIVE AND USE PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE.

BASED ON THE STATUTORY LANGUAGE AND CURRENT US EPA GUIDANCE, THE NINE CRITERIA USED TO EVALUATE THE REMEDIAL ALTERNATIVES LISTED ABOVE WERE:

1. OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT ADDRESSES WHETHER OR NOT THE REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS ARE ELIMINATED,REDUCED OR CONTROLLED THROUGH TREATMENT, ENGINEERING CONTROLS, OR INSTITUTIONAL CONTROLS.

2. COMPLIANCE WITH ARARS ADDRESSES WHETHER OR NOT THE REMEDY WILL MEET ALL OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER ENVIRONMENTAL STATUES AND/OR PROVIDE GROUNDS FOR INVOKING A WAVIER.

3. LONG-TERM EFFECTIVENESS AND PERMANENCE REFERS TO THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME ONCE CLEANUP GOALS HAVE BEEN MET.

4. REDUCTION OF TOXICITY, MOBILITY, OR VOLUME IS THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES A REMEDY MAY EMPLOY.

5. SHORT-TERM EFFECTIVENESS INVOLVES THE PERIOD OF TIME NEEDED TO ACHIEVE PROTECTION AND ANY ADVERSE IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT THAT MAY BE POSED DURING THE CONSTRUCTION AND IMPLEMENTATION PERIODS UNTIL CLEANUP GOALS ARE ACHIEVED.

6. IMPLEMENTABILITY IS THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY INCLUDING THE AVAILABILITY OF GOODS AND SERVICES NEEDED TO IMPLEMENT THE CHOSEN SOLUTION.

7. COST INCLUDES CAPITAL AND OPERATION AND MAINTENANCE COSTS.

8. SUPPORT AGENCY ACCEPTANCE INDICATES WHETHER, BASED ON ITS REVIEW OF THE RI/FS AND PROPOSED PLAN, THE SUPPORT AGENCY (IDEM) CONCURS, OPPOSES, OR HAS NO COMMENT ON THE PREFERRED ALTERNATIVE.

9. COMMUNITY ACCEPTANCE INDICATES THE PUBLIC SUPPORT OF A GIVEN REMEDY. THIS CRITERIA IS DISCUSSED IN THE RESPONSIVENESS SUMMARY.

5.1.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

ALL OF THE ALTERNATIVES, WITH THE EXCEPTION OF THE NO ACTION ALTERNATIVE, WOULD PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT BY ELIMINATING, REDUCING, OR CONTROLLING RISK FROM THE ENVIRONMENT THROUGH TREATMENT, ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS. AT THE NO ACTION ALTERNATIVE DOES NOT SATISFY THE REMEDIAL ACTION GOAL TO PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, IT IS NOT ELIGIBLE FOR SELECTION. THE ASPECTS CONSIDERED IN THIS EVALUATION ARE SUMMARIZED IN TABLE 14.

5.1.2 COMPLIANCE WITH ARARS

ALL OF THE ALTERNATIVES, EXCEPT FOR THE NO ACTION ALTERNATIVE, WOULD MEET ALL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF FEDERAL AND STATE ENVIRONMENTAL LAWS. SECTION 6.6 (TABLE 21) LISTS THE ENVIRONMENTAL REGULATIONS, POLICIES AND GUIDELINES THAT ARE APPLICABLE TO THE CAPE FEAR SITE. TABLE 15 PRESENTS A SUMMARY OF THIS EVALUATION.

SINCE ALL CONTAMINATION ON SITE IS CHARACTERIZED AS CONTAMINATED SOIL AND DEBRIS AND THERE IS NO RCRA CHARACTERIZED WASTE ON-SITE, LAND BAN REQUIREMENTS, AS DEFINED IN 40 CFR 268, ARE NOT APPLICABLE AT THE CAPE FEAR SITE.

5.1.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

THE ASPECTS OF THIS EVALUATION ARE SUMMARIZED IN TABLE 16 UNDER THE COLUMN ENTITLED "LONG TERM REMEDIATION IMPACT".

5.1.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

THE ASPECTS OF THIS EVALUATION ARE ALSO SUMMARIZED IN TABLE 14 UNDER THE COLUMN ENTITLED "LONG TERM REMEDIATION IMPACT".

5.1.5 SHORT-TERM EFFECTIVENESS

THE ASPECTS OF THIS EVALUATION ARE SUMMARIZED IN TABLE 16 UNDER THE COLUMN ENTITLED "SHORT TERM REMEDIATION IMPACT".

5.1.6 IMPLEMENTABILITY

TABLE 17 PRESENTS A SUMMARY OF THE EVALUATION PERFORMED ON THE CONSTRAINTS TO IMPLEMENTATION.

5.1.7 COST

SUMMARIES OF PRESENT WORTH COSTS INCLUDING THE MINIMUM AND MAXIMUM COSTS GENERATED BY A SENSITIVITY ANALYSIS FOR THESE ALTERNATIVES IS GIVEN IN TABLES 18 THROUGH 20. THE UNCERTAINTY CONSIDERED IN THE SENSITIVITY ANALYSIS WAS THE VOLUME. VOLUME FOR EACH CONTAMINATED ENVIRONMENTAL MEDIUM. NO SENSITIVITY ANALYSIS WAS CONDUCTED FOR THE HAZARDOUS MATERIALS, TANKS AND PIPING ALTERNATIVES.

5.1.8 STATE ACCEPTANCE

THE STATE OF NORTH CAROLINA SUPPORTS THE ALTERNATIVE STATED IN THE DECLARATION AND SECTION 6.0. THE STATE OF CAROLINA RECOGNIZES THE 10% COST SHARE AND OPERATION AND MAINTENANCE RESPONSIBILITIES ASSOCIATED WITH THIS ALTERNATIVE.

5.1.9 COMMUNITY ACCEPTANCE

THE AGENCY CONDUCTED A PUBLIC MEETING ON FEBRUARY 21, 1989 AT THE SEVENTY-FIRST SENIOR HIGH SCHOOL AUDITORIUM IN FAYETTEVILLE, NORTH CAROLINA. THE AGENCY DISCUSSED THE FINDINGS OF THE RI, REVIEWED THE EVALUATION OF REMEDIAL TECHNOLOGIES AND REMEDIAL ACTION ALTERNATIVES AS PRESENTED IN THE DRAFT FINAL FEASIBILITY STUDY DATED DECEMBER 16, 1988 AND PRESENTED THE AGENCY'S PREFERRED REMEDIAL ACTION ALTERNATIVE. THE MEETING INITIATED A THREE WEEK COMMENT PERIOD. BESIDES THE QUESTIONS ADDRESSED AT THE PUBLIC MEETING, NO ADDITIONAL COMMENTS/QUESTIONS/CONCERNS WERE RECEIVED BY THE AGENCY.

COMMUNITY ACCEPTANCE IS ASSESSED IN THE ATTACHED RESPONSIVENESS SUMMARY. THE RESPONSIVENESS SUMMARY PROVIDES A THOROUGH REVIEW OF THE PUBLIC COMMENTS RECEIVED ON THE RI, FS, PROPOSED PLAN, AND US EPA'S RESPONSES TO THE COMMENTS RECEIVED.

#RA

6.0 RECOMMENDED ALTERNATIVE

6.1 DESCRIPTION OF RECOMMENDED REMEDY

DESCRIPTION OF SELECTED REMEDY

PRIOR TO INITIATING ANY REMEDIAL ACTION ON-SITE, A SITE SURVEY WILL BE CONDUCTED TO DETERMINE THE PRESENCE OF ANY ENDANGERED PLANT SPECIES EXIST ON-SITE.

REMEDIATION OF HAZARDOUS MATERIALS TANKS & PIPING

OFF-SITE DISPOSAL OF SODIUM DICROMATE - COPPER SULFATE - ARSENIC PENTOXIDE (CCA) SALT CRYSTALS, THE SOLIDIFIED CREOSOTE AND ASBESTOS-CONTAINING PIPE INSULATION. THE CCA CRYSTALS AND SOLIDIFIED CREOSOTE WILL BE DISPOSED OF AT A RCRA PERMITTED LANDFILL. THE ASBESTOS-CONTAINING PIPE INSULATION WILL BE DISPOSED OF AT THE CUMBERLAND COUNTY SOLID WASTE FACILITY PURSUANT TO THE FACILITIES SPECIFICATIONS.

THE TANKS AND ASSOCIATED PIPING, ABOVE AND BELOW GROUND, WILL BE EMPTIED, FLUSHED AND CLEANED, INCLUDING TRIPLE RINSING, TO RENDER THE METAL NON-HAZARDOUS. THE METAL WILL THEN BE CUT AND EITHER SOLD TO A LOCAL SCRAP METAL DEALER OR DISPOSED OF AT THE CUMBERLAND COUNTY SOLID WASTE FACILITY. FOR THOSE TANKS AND/OR PIPING THAT CANNOT BE CLEANED SUFFICIENTLY TO RENDER THEM NON-HAZARDOUS WILL BE TRANSPORTED TO A RCRA PERMITTED LANDFILL FOR DISPOSAL.

THE CONTENTS OF THE TANKS AND ASSOCIATED PIPING CONTAINS APPROXIMATELY 50,000 GALLONS OF 3 PERCENT CCA SOLUTION AND 15,000 GALLONS OF CCA CONTAMINATED WASTEWATER. A BUYER OF THE 60,000 GALLONS OF 3 PERCENT CCA SOLUTION WILL FIRST BE PURSUED. IF NO BUYER CAN BE FOUND, THEN THE 50,000 GALLONS OF 3 PERCENT CCA SOLUTION ALONG WITH THE 15,000 GALLONS OF CCA CONTAMINATED

WASTEWATER AS WELL AS WASTEWATER GENERATED ON-SITE WILL BE TREATED ON-SITE THROUGH THE WATER TREATMENT SYSTEM SET UP FOR TREATING THE PUMPED SURFACE WATERS AND EXTRACTED GROUNDWATER.

SOURCE CONTROL (REMEDIATION OF CONTAMINATED SOILS)

THE PREFERRED ALTERNATIVE FOR THE REMEDIATION OF CONTAMINATED SOILS/SEDIMENT IS A SOIL WASHING/FLUSHING TECHNIQUE. THE ALTERNATE SOURCE CONTROL ALTERNATIVE IS A LOW TEMPERATURE PROCESS TO REMOVE THE ORGANICS CONTAMINANTS FOLLOWED BY EITHER A SOIL WASHING/FLUSHING TECHNIQUE OR SOIL FIXATION/SOLIDIFICATION/STABILIZATION PROCESS TO ADDRESS THE INORGANICS. THE DECISION AS TO WHICH SOURCE CONTROL ALTERNATIVE WILL BE IMPLEMENTED WILL BE BASED ON DATA GENERATED BY THE SOIL WASHING/FLUSHING TREATABILITY STUDY TO BE CONDUCTED DURING THE REMEDIAL DESIGN.

CONTAMINATED SOILS/SEDIMENT WILL BE EXCAVATED, TREATED AND PLACED BACK IN THE EXCAVATION. ALL WASTEWATER GENERATED WILL EITHER BE REUSED OR TREATED ON-SITE. FOLLOWING COMPLETION OF ON-SITE REMEDIAL ACTIVITIES, THOSE AREAS DISTURBED WILL BE REVEGETATED.

MIGRATION CONTROL (REMEDIATION OF CONTAMINATED GROUNDWATER)

GROUNDWATER EXTRACTION WILL BE ACCOMPLISHED THROUGH THE USE OF WELL POINTS IN THE UPPER (SURFICIAL) AQUIFER. RECOVERY WILL BE CONDUCTED IN 10,000 SQUARE FOOT SUBAREAS AT A TIME, AND THE WELL POINTS WILL BE MOVED TO ADJACENT AREAS FOR SUBSEQUENTIAL DEWATERING.

DUE TO LOCAL CONTAMINATION OF THE LOWER AQUIFER, THE LOWER AQUIFER WILL BE PUMPED FOLLOWING REMEDIATION OF THE OVERLYING UPPER AQUIFER IN THIS AREA. THIS WILL PREVENT POTENTIAL CONTAMINANT DRAWDOWN TO DEEPER DEPTHS.

A WATER TREATMENT SYSTEM WILL BE ESTABLISHED ON-SITE. THE SYSTEM'S INFLUENT WILL INCLUDE CONTENTS OF THE TANKS AND PIPING, ALL WASTEWATER GENERATED DUE TO REMEDIAL ACTIONS IMPLEMENTED, PUMPED SURFACE WATER, AND EXTRACTED GROUNDWATER. THE LEVEL AND DEGREE OF TREATMENT WILL DEPEND ON 1) THE LEVEL OF CONTAMINANTS IN THE INFLUENT AND 2) THE ULTIMATE DISCHARGE POINT OF THE TREATED WATER. THERE ARE TWO WATER DISCHARGE ALTERNATIVES FOR THE TREATED WATER. THE OPTIMAL CHOICE IS THE LOCAL SEWER SYSTEM. THE OTHER ALTERNATIVE IS TO DISCHARGE THE EFFLUENT TO A SURFACE STREAM. THE RANGE OF TREATMENT FOR THE CONTAMINATED WATER INCLUDES BIOLOGICAL DEGRADATION, AIR STRIPPING, FILTRATION THROUGH ACTIVATED CARBON FILTER, AND METAL REMOVAL THROUGH FLOCCULATION, SEDIMENTATION AND PRECIPITATION. THE POINT OF DISCHARGE AND THE DEGREE OF TREATMENT WILL BE DETERMINED IN THE REMEDIAL DESIGN STAGE. THE EFFLUENTS, INCLUDING BOTH DISCHARGED WATER AND/OR AIR, WILL MEET ALL ARAR'S.

THIS RECOMMENDED ALTERNATIVES MEET THE REQUIREMENTS OF THE NCP, 40 CFR SECTION 300.68(J) AND SARA. THIS RECOMMENDED REMEDY PERMANENTLY AND SIGNIFICANTLY REDUCES THE VOLUME OF HAZARDOUS SUBSTANCES IN THE GROUNDWATER, REDUCES THE TOXICITY AND/OR MOBILITY OF CONTAMINANTS IN THE SOILS.

6.2 OPERATIONS AND MAINTENANCE

LONG TERM OPERATION AND MAINTENANCE (O&M) WILL CONCENTRATE ON THE GROUNDWATER EXTRACTION, WATER TREATMENT AND GROUNDWATER MONITORING SYSTEMS.

6.3 COST OF RECOMMENDED ALTERNATIVE

THE ESTIMATED PRESENT WORTH COST FOR CONTAINERIZING AND TRANSPORTING THE CCA CRYSTALS AND SOLIDIFIED CREOSOTE TO PINEWOOD, SC, IS $42,400. THE ESTIMATED COST FOR DISPOSING OF THE ASBESTOS-CONTAINING PIPING INSULATION AT THE LOCAL COUNTY LANDFILL IS $100. THE PRESENT WORTH COST FOR CLEANING AND DISPOSING OF THE TANKS AND PIPING IS $87,900 IF A METAL DEALER IS FOUND TO

PURCHASE THE SCRAP METAL OR $112,400 IF THE AGENCY NEEDS TO DISPOSE OF THE SCRAP METAL AT PINEWOOD, SC. THERE ARE NO O&M COSTS ASSOCIATED WITH THE ABOVE ACTIVITIES.

THE TREATMENT OF THE LIQUIDS HELD IN THE TANKS, 50,000 GALLONS OF 3 PERCENT CCA SOLUTION AND 16,000 GALLONS OF CCA CONTAMINATED WASTEWATER, HAS A PRESENT WORTH COST OF APPROXIMATELY $104,000. THE O&M COSTS HAVE BEEN FACTORED INTO THE O&M COSTS OF OPERATING AND MAINTAINING THE WATER TREATMENT SYSTEM.

THE ESTIMATED PRESENT WORTH COST FOR THE SOIL WASHING/FLUSHING ALTERNATIVE FOR CONTAMINATED SOILS AND SEDIMENTS IS $11.00 MILLION. THIS INCLUDES CAPITAL AND O&M COSTS FOR THE 1.5 YEAR TREATMENT PERIOD. THE ESTIMATED

PRESENT WORTH COST FOR THE LOW TEMPERATURE DESTRUCTION PROCESS COMBINED WITH EITHER SOIL WASHING FLUSHING OR A SOIL FIXATION SOLIDIFICATION STABILIZATION PROCESS FOR CONTAMINATED SOILS AND SEDIMENTS IS $14.03 MILLION. THIS INCLUDES CAPITAL AND O&M COSTS FOR THE TREATMENT PERIOD.

THE ESTIMATED PRESENT WORTH COST FOR PUMPING SURFACE WATER AND EXTRACTING GROUNDWATER AND TREATING THE COMMINGLED WATERS RANGES FROM $3.4 TO $3.6 MILLION, DEPENDING ON THE EXTENT OF TREATMENT AND ULTIMATE DISCHARGE POINT FOR THE TREATED WATER. THE CAPITAL COSTS AND PRESENT WORTH O&M COSTS OVER 30 YEARS RANGE FROM $2.11 TO $2.34 MILLION AND $1.02 TO $1.31 MILLION, RESPECTIVELY.

THE PRESENT WORTH COST OF THE PREFERRED REMEDY, INCLUDING ALL ACTIVITIES, RANGES FROM $14.37 MILLION TO $14.91 MILLION.

6.4 SCHEDULE

THE PLANNED SCHEDULE FOR REMEDIAL ACTIVITIES AT THE CAPE FEAR SITE IS AS FOLLOWS:

JUNE 1989 -- APPROVE RECORD OF DECISION
JULY 1989 -- INITIATE REMEDIAL DESIGN/TREATABILITY STUDY
OCTOBER 1989 -- SUPERFUND/STATE CONTRACT SIGNED
NOVEMBER 1989 -- COMPLETE TREATABILITY STUDIES
DECEMBER 1989 -- INITIATE REMEDIAL ACTION FOR ADDRESSING CONTAMINATED GROUNDWATER AND OTHER SPECIFIC CLEANUP ACTIVITIES
APRIL 1990 -- COMPLETE REMEDIAL DESIGN FOR SOURCE CONTROL AND MOBILIZE

6.5 FUTURE ACTIONS

THE ONLY ANTICIPATED FUTURE ACTION EXPECTED TO FOLLOW COMPLETION OF THE REMEDIAL ACTION IS PERIODIC MONITORING OF GROUNDWATER TO INSURE REMEDIATED LEVELS OBTAINED DURING THE REMEDIATION IS MAINTAINED.

6.6 CONSISTENT WITH OTHER ENVIRONMENTAL LAWS

A REMEDIAL ACTION PERFORMED UNDER CERCLA MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. ALL ALTERNATIVE CONSIDERED FOR THE CAPE FEAR SITE WERE EVALUATED ON THE BASIS OF THE DEGREE TO WHICH THEY COMPLIED WITH THESE REGULATIONS. THE RECOMMENDED ALTERNATIVES WERE FOUND TO MEET OR EXCEED ALL APPLICABLE ENVIRONMENTAL LAWS, AS DISCUSSED BELOW:

#CR

7.0 COMMUNITY RELATIONS

FACT SHEETS WERE TRANSMITTED TO INTERESTED PARTIES, RESIDENTS, MEDIA AND LOCAL, STATE AND

FEDERAL OFFICIALS DURING THE RI/FS PROCESS. THE AGENCY ALSO CONDUCTED THE FS PUBLIC MEETING.

THE INFORMATION REPOSITORY/ADMINISTRATIVE RECORD WAS ESTABLISHED AT CUMBERLAND COUNTY PUBLIC LIBRARY & INFORMATION CENTER LOCATED AT 300 MAIDEN LANE, FAYETTEVILLE, NORTH CAROLINA 28301.

A PUBLIC MEETING WAS HELD ON FEBRUARY 21, 1989, AT THE SEVENTY-FIRST SENIOR HIGH SCHOOL IN FAYETTEVILLE, NORTH CAROLINA. AT THIS MEETING, THE REMEDIAL ALTERNATIVES DEVELOPED IN THE FS WERE REVIEWED AND DISCUSSED AND EPA'S PREFERRED REMEDIAL ALTERNATIVE WAS DISSEMINATED. THE GROUNDWATER MIGRATION ALTERNATIVE WAS PRESENTED AS DESCRIBED IN SECTION 6.1 DESCRIPTION OF RECOMMENDED ALTERNATIVE. TWO SOURCE REMEDIATION ALTERNATIVES WERE PRESENTED. EPA'S PREFERRED SOURCE REMEDIATION ALTERNATIVE FOR IS A SOIL WASHING PROCESS. THE AGENCY'S BACK-UP ALTERNATIVE IN THE EVENT THAT A EFFECTIVE SOIL WASHING PROCESS CANNOT BE DEVISED IS AN ON-SITE LOW TEMPERATURE PROCESS TO MITIGATE THE ORGANICS FOLLOWED BY EITHER SOIL WASHING OR A SOIL FIXATION SOLIDIFICATION STABILIZATION PROCESS TO ADDRESS THE METALS. BOTH ALTERNATIVES ARE PERMANENT REMEDIATIONS BUT THE SOIL WASHING ALTERNATIVE IS ESTIMATED TO BE 3 MILLION DOLLARS LESS THAN THE LOW TEMPERATURE PROCESS.

THE PUBLIC COMMENT PERIOD CONCLUDED ON MARCH 14, 1989. THE ONLY COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD WERE THOSE AIRED AND RESPONDED TO AT THE PUBLIC MEETING. THE RESPONSIVENESS SUMMARY SUMMARIZES THE COMMENTS STATED IN THE PUBLIC MEETING.

#SI

8.0 STATE INVOLVEMENT

THE STATE INVOLVEMENT HAS BEEN MAINTAINED THROUGHOUT THE RI/FS PROCESS WITH REVIEWING PERTINENT DOCUMENTS SUCH AS THE DRAFT REMEDIAL INVESTIGATION REPORT, THE DRAFT FEASIBILITY STUDY, THE DRAFT RECORD OF DECISION AND HAVE BEEN CARBON COPIED ALL RELEVANT CORRESPONDENCES.

THE STATE OF NORTH CAROLINA SUPPORTS THE ALTERNATIVE STATED IN THE DECLARATION AND SECTION 6.0. THE STATE OF NORTH CAROLINA RECOGNIZES THE 10% COST SHARE UNDER CERCLA, SECTION 104(C) AND OPERATION AND MAINTENANCE RESPONSIBILITES ASSOCIATED WITH THIS ALTERNATIVE.

#RS

APPENDIX A
RESPONSIVENESS SUMMARY

THIS COMMUNITY RESPONSIVENESS SUMMARY IS DIVIDED INTO THE FOLLOWING SECTIONS:

SECTION I. OVERVIEW. THIS SECTION DISCUSSES EPA'S PREFERRED REMEDIAL ACTION ALTERNATIVE AND PUBLIC REACTION TO THIS ALTERNATIVE.

SECTION II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS. THIS SECTION PROVIDES A BRIEF HISTORY OF COMMUNITY INTEREST AND CONCERNS RAISED DURING REMEDIAL PLANNING ACTIVITIES AT THE CAPE FEAR WOOD PRESERVING SITE.

SECTION III. SUMMARY OF MAJOR COMMENTS RECEIVED DURING THE PUBLIC MEETING AND THE PUBLIC COMMENT PERIOD AND EPA'S RESPONSES TO THESE COMMENTS. BOTH THE COMMENTS AND EPA'S RESPONSES ARE PROVIDED.

SECTION IV. REMAINING CONCERNS. THIS SECTION DESCRIBES THE REMAINING COMMUNITY CONCERNS THAT EPA SHOULD BE AWARE OF IN CONDUCTING THE REMEDIAL DESIGN AND REMEDIAL ACTION AT THE CAPE FEAR WOOD PRESERVING SITE.

SECTION V. TRANSCRIPT OF THE PUBLIC MEETING. THIS SECTION PROVIDES A TRANSCRIPT OF THE FEASIBILITY STUDY PUBLIC MEETING HELD ON FEBRUARY 21, 1989 AT THE SEVENTY-FIRST SENIOR HIGH SCHOOL LOCATED NEAR THE SITE.

SECTION I. OVERVIEW

THE PUBLIC MEETING AT WHICH EPA PRESENTED IT'S PREFERRED ALTERNATIVE TO THE PUBLIC INITIATED THE PUBLIC COMMENT PERIOD WHICH ENDED ON MARCH 14, 1989. THE ALTERNATIVE ADDRESSES BOTH THE SOIL AND GROUNDWATER CONTAMINATION PROBLEMS AT THE SITE. THE PREFERRED ALTERNATIVE SPECIFIED IN THE RECORD OF DECISION (ROD) INCLUDES: PERMANENT TREATMENT OF CONTAMINATED SOIL, GROUNDWATER, AND SURFACE WATER AND SEDIMENT.

IN THE PUBLIC MEETING, HELD FEBRUARY 21, 1989, TWO REMEDIAL ALTERNATIVES WERE PROPOSED TO THE PUBLIC FOR SOURCE CONTROL. SOURCE CONTROL REMEDIAL ACTIONS ADDRESSES BOTH CONTAMINATED SOILS AND SEDIMENTS IN THE DRAINAGE DITCHES AND SWAMPS. EPA'S PREFERRED ALTERNATIVE IS SOIL WASHING WHICH IS EXPECTED TO REMOVE BOTH THE ORGANIC AND INORGANIC CONTAMINANTS. THIS IS THE PREFERRED ALTERNATIVE BECAUSE IT ELIMINATES, PERMANENTLY, THE SOURCE OF CONTAMINATION. IN CASE THAT THE TREATABILITY STUDY INDICATES THAT SOIL WASHING WILL NOT ACHIEVE THE CLEAN UP GOALS STATED IN THE RECORD OF DECISION (ROD), TABLE__, THE AGENCY PROPOSED A LOW TEMPERATURE DESORPTION PROCESS TO REMOVE THE ORGANICS AND A SOIL FIXATION/STABILIZATION/SOLIDIFICATION PROCESS TO ADDRESS THE INORGANICS. THE SOIL WASHING TREATABILITY STUDY IS TO BE PERFORMED DURING THE REMEDIAL DESIGN STAGE.

THE COMMUNITY, IN GENERAL, FAVORS REMEDIAL ACTION AT THE SITE.

SECTION II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

THE CAPE FEAR SITE IS LOCATED IN CUMBERLAND COUNTY, NORTH CAROLINA, ON THE WESTERN SIDE OF FAYETTEVILLE NEAR HIGHWAY 401. IT INCLUDES ABOUT NINE ACRES OF A 41 ACRE TRACT OF LAND. THE SITE IS ADJACENT TO OTHER INDUSTRIAL/COMMERCIAL ESTABLISHMENTS AS WELL AS PRIVATE RESIDENCES. FOUR HOMES ARE LOCATED NEAR THE SITE. IN ADDITION, A SUBDIVISION NAMED "SOUTHGATE" IS LOCATED

APPROXIMATELY A QUARTER OF A MILE SOUTH OF THE SITE AND HOUSES APPROXIMATELY 1,000 PEOPLE.

INTERVIEWS CONDUCTED IN 1987 REVEALED THAT MOST RESIDENTS ON REILLY ROAD AND ON SCHOOL STREET HAVE LIVED IN THE AREA FOR MANY YEARS. DUE TO THE TRANSIENT NATURE OF MILITARY, THE MAJORITY OF SOUTHGATE RESIDENTS ARE RENTERS WHO ARE NOT IN THE AREA LONG ENOUGH TO ESTABLISH STRONG COMMUNITY TIES.

ALTHOUGH THERE HAS BEEN NO ORGANIZED COMMUNITY INVOLVEMENT WITH THE CAPE FEAR SITE TO DATE, COMMUNITY INTEREST IN, AND CONCERN WITH, CONTAMINATION PROBLEMS AT THE SITE HAVE FLUCTUATED IN INTENSITY SINCE THE DISCOVERY OF CONTAMINANTS IN A RESIDENTIAL WELL ACROSS FROM THE SITE IN 1977. COMMUNITY CONCERNS HAVE RARELY BEEN EXPRESSED TO GOVERNMENT OFFICIALS; RATHER, INFORMATION HAS BEEN SHARED AND FEARS DISCUSSED PRIMARILY AMONG AREA RESIDENTS THEMSELVES.

SOME SPECIFIC FEARS BY LOCAL RESIDENTS INCLUDES HOW THEY BELIEVE THEY HAVE BEEN AND WILL BE AFFECTED BY THE CONTAMINATION PROBLEM. OTHER SPECIFIC ISSUES OF CONCERN MENTIONED BY AREA RESIDENTS AND LOCAL OFFICIALS ARE:

1. EXTENT AND NATURE OF THE CONTAMINATION

AREA RESIDENTS POSSESS VARIOUS AMOUNTS AND TYPES OF INFORMATION ABOUT THE EXTENT OF CONTAMINATION FROM THE CAPE FEAR SITE, SOME OF IT STEMMING FROM MISINFORMATION AND SOME FROM SPECULATION. RESIDENTS DO NOT HAVE A THOROUGH UNDERSTANDING OF SUSPECTED CONTAMINATION SOURCES AND WHETHER OR NOT THE AGENCY IS DEALING WITH THE FULL EXTENT OF THE CONTAMINATION PROBLEM.

2. DRINKING WATER QUALITY

SEVERAL RESIDENTS EXPRESSED CONCERN WITH THE QUALITY OF THEIR DRINKING WATER AND THE POTENTIAL ADVERSE HEALTH EFFECTS FROM IT'S CONSUMPTION.

3. HEALTH AND SAFETY

SEVERAL OF THE RESIDENTS QUESTIONED THE HEALTH AND SAFETY IMPLICATIONS POSED BY THE SITE'S ACCESSIBILITY TO CHILDREN AND YOUNG ADULTS AND SUGGESTED THAT THE AREA BE SECURED. THE NUMEROUS ACTS OF VANDALISM THAT HAVE OCCURRED AT THE SITE SUGGESTS THAT THE AREA MAY BE A GATHERING SPOT FOR YOUTHS CARRYING OUT ACTIVITIES THAT, AT THE TIME GO UNDETECTED.

4. PROPERTY VALUE AND QUALITY OF LIFE

ALMOST EVERY RESIDENT INTERVIEWED MENTIONED REDUCTIONS IN THEIR PROPERTY VALUE AS AN AREA OF CONCERN. SOME LOCAL OFFICIALS VIEW THE AREA SURROUNDING THE SITE AS HOLDING A GOOD DEAL OF POTENTIAL FOR RESIDENTIAL DEVELOPMENT. THEY ARE CONCERNED THAT THE PROPERTY WILL NOT BE RESTORED TO ACCOMMODATE SUCH GROWTH.

5. OTHER AREA-WIDE ENVIRONMENTAL ISSUES

ACCORDING TO LOCAL OFFICIALS, AN EFFORT TO SITE A HAZARDOUS WASTE INCINERATOR IN THE AREA ATTRACTED 4,000 PEOPLE TO THE PUBLIC MEETING OF THE PROPOSED INCINERATOR PERMIT. ORGANIZED OPPOSITION TO NORTH CAROLINA'S PROPOSED MEMBERSHIP IN A LOW-LEVEL RADIOACTIVE WASTE COMPACT THAT WOULD OBLIGE THE STATE TO EVENTUALLY HOST A DISPOSAL SITE.

SECTION III. SUMMARY OF PUBLIC COMMENTS RECEIVED DURING THE PUBLIC MEETING AND THE PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

COMMENTS RAISED DURING THE CAPE FEAR WOOD PRESERVING PUBLIC MEETING AND PUBLIC COMMENT PERIOD

ARE SUMMARIZED BRIEFLY BELOW. THE COMMENT PERIOD WAS OPEN FROM FEBRUARY 21 TO MARCH 14, 1989 TO RECEIVE COMMENTS FROM THE PUBLIC ON THE DRAFT FEASIBILITY STUDY AND PROPOSED REMEDIAL ALTERNATIVE.

THERE WAS A MODERATE RESPONSE FROM THE COMMUNITY IN THE PUBLIC MEETING BUT NO COMMENTS WERE RECEIVED DURING THE PURSUING THREE WEEK PUBLIC COMMENT PERIOD. SUMMARIES OF THE QUESTIONS RECEIVED DURING THE PUBLIC MEETING ARE PRESENTED BELOW.

PUBLIC MEETING

THE PUBLIC MEETING WAS HELD ON FEBRUARY 21, 1989 AT THE SEVENTY-FIRST SENIOR HIGH SCHOOL AUDITORIUM. QUESTIONS AND COMMENTS FELL INTO FIVE MAJOR CATEGORIES INCLUDING: CONCERN ABOUT PUBLIC HEALTH, THOROUGHNESS OF RESEARCH EFFORTS TO DETERMINE THE EXTENT AND IMPACT OF CONTAMINATION, TIME INVOLVED IN CLEANING UP THE SITE AND RESTORING THE LAND, COST OF THE REMEDIAL ACTION, AND WHERE THE DISCHARGE OF THE TREATED/UNTREATED WATER FROM THE SITE WILL GO.

THE AGENCY'S PRESENTATION AND THE QUESTIONS AND COMMENTS RECEIVED FROM THE PUBLIC DURING THE FEBRUARY 21, 1989 PUBLIC MEETING IS PROVIDED IN SECTION V.

PUBLIC COMMENT PERIOD

NO COMMENTS WERE RECEIVED BY THE AGENCY DURING THE THREE WEEK COMMENT PERIOD THAT ENDED ON MARCH 14, 1989.

SECTION IV. REMAINING PUBLIC CONCERNS

IN ADDITION TO THOSE CONCERNS VOICED AT THE PUBLIC MEETING, SOME ADDITIONAL PUBLIC CONCERNS ARE DESCRIBED BELOW.

- ADDITIONAL SAMPLING/ANALYSIS OF RESIDENTIAL WELLS FOR VOLATILE ORGANICS.
- LENGTH OF TIME PRIOR TO REMOVING OFF-SITE MONITOR WELLS.

SECTION V. CAPE FEAR FEASIBILITY STUDY PUBLIC MEETING

CAPE FEAR PUBLIC MEETING
FAYETTEVILLE, NORTH CAROLINA

21 FEBRUARY 1989
7:00 PM

JB: THIS IS EPA'S MEETING ON THE CAPE FEAR WOOD PRESERVING SITE. AS DIRECTED BY THE SUPERFUND LAW, THE AGENCY IS REQUIRED TO HAVE AT LEAST ONE PUBLIC MEETING FOR A SUPERFUND SITE AT THE CONCLUSION OR COMPLETION OF THE FEASIBILITY STUDY FOR THAT SITE, AND THE AGENCY IS NOW AT THAT STAGE.

WHAT I WOULD LIKE TO DO IS BRIEFLY INTRODUCE THOSE FROM THE AGENCY WHO CAME UP; AND THEN, AS BRIEFLY AND QUICKLY AS POSSIBLE, DESCRIBE WHAT WE CALL THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY PROCESS, AND THEN DESCRIBE WHAT WE FOUND ON-SITE (THE CONTAMINATION), WHICH IS THE RI FINDINGS; THEN BRIEFLY GO THROUGH THE EVALUATION PROCESSTHAT WE WENT THROUGH IN THE FEASIBILITY STUDY TO COME UP WITH THE REMEDY WE SELECTED OR WE'RE PROPOSING TO USE TO CLEAN-UP THE SITE; THEN EXPLAIN IN BETTER DETAIL THE REMEDY WE'RE PROPOSING; AND THEN FIELD ANY QUESTIONS THAT YOU MAY HAVE.

I'M JOHN BORNHOLM; I'VE BEEN WITH THE AGENCY FOR ALMOST FIVE YEARS. I'M IN THE SUPERFUND PROGRAM ON THE REMEDIAL SIDE. THIS GENTLEMAN STANDING UP IS MICHAEL HENDERSON WITH OUR PUBLIC RELATIONS PART, AND CHRIS KAHLE IS ALSO IN THE SUPERFUND PROGRAM.

OUT FRONT, THERE ARE FOUR PACKAGES OF INFORMATION: THREE FACT SHEETS AND ONE PACKAGE OF OVERHEADS I WILL GO THROUGH TONIGHT. THE FIRST PACKAGE WAS SENT OUT IN NOVEMBER AND BASICALLY TELLS OR EXPLAINS WHAT THE FINDINGS OF THE REMEDIAL INVESTIGATION WERE. THE SECOND ONE, WHICH WAS SENT OUT IN DECEMBER, GOES THROUGH THE FEASIBILITY STUDY. THE LAST ONE IS CALLED THE PROPOSED PLAN, AND IT DESCRIBES THE ALTERNATIVES EVALUATED TO CLEAN UP THE SITE AND THEN IDENTIFIES THE PREFERRED REMEDIAL ALTERNATIVE.

THIS FIGURE { } GIVES YOU AN IDEA OF WHERE THE SITE IS. THIS { } IS BASICALLY A MORE CLOSE UP PICTURE; AND THIS FIGURE { } IDENTIFIES MORE DETAIL OF THE SITE ITSELF.

THE REMEDIAL INVESTIGATION WAS CONDUCTED THE SUMMER OF '87, AND BASICALLY THE REMEDIAL INVESTIGATION CONSISTED OF TAKING ENVIRONMENTAL SAMPLES, AND ANALYZING THOSE SAMPLES FOR CONTAMINANTS WE EXPECTED TO SEE ON-SITE AS WELL AS TAKING 10% OF THOSE SAMPLES AND ANALYZING FOR A FULL RANGE OF POSSIBLE CONTAMINANTS. THE ENVIRONMENTAL MEDIA SAMPLE INCLUDED SOILS, SUBSURFACE SOILS, SURFACE WATER AND GROUNDWATER. THE CONTAMINANTS THAT WERE OF CONCERN WERE A RESULT OF THE ACTIVITIES FROM THE WOOD TREATING PROCESS, AND BASICALLY THAT'S CREOSOTE MATERIAL, COAL TAR MATERIAL AND THEN METALS COMING FROM WHAT'S CALLED A CCA PROCESS, A WOLMANIZING PROCESS. THE LETTERS STAND FOR COPPER, CHROMIUM, AND ARSENIC; THOSE ARE THE THREE METALS WE WERE LOOKING AT AS WELL AS THE CREOSOTE.

THE NEXT COUPLE OF OVERHEADS I HAVE SHOW SAMPLING AREAS AND THE RANGE OF CONCENTRATIONS WE FOUND ON-SITE.

WE USE A GRID SYSTEM TO TAKE OUR SURFACE SOIL SAMPLES, AND THIS IS FOR CHROMIUM. THE COLORED IN AREAS ARE THE AREAS THAT HAD LEVELS HIGHER THAN CLEANUP STANDARDS, SO THESE WOULD BE THE AREA IDENTIFIED FOR REMEDIATION DUE TO CHROMIUM CONTAMINATION.

THIS OVERHEAD IS FOR ARSENIC; AGAIN, WE'RE TALKING ABOUT SURFACE SOILS, AND THE HATCHED-IN, X ED-IN AREA IS THE AREA THAT HAD ARSENIC LEVELS ABOVE THE CLEANUP STANDARDS, AND THIS WOULD BE THE AREA IDENTIFIED FOR REMEDIATION.

THIS OVERHEAD IS FOR CREOSOTE. WE USE ANOTHER TERM FOR IT - PAHS (POLYCYCLIC AROMATIC HYDROCARBONS). AGAIN, THE AREA X'ED-IN IS THE AREA IDENTIFIED FOR REMEDIATION DUE TO CONTAMINATION DUE TO CREOSOTE.

ONE OF THE COMPOUNDS THAT WE ARE NOT EXPECTING TO SEE ON-SITE AS A CONTAMINANT IS BENZENE. THIS CONTAMINANT IS BASICALLY DUE TO THE RESULT OF HAVING A GASOLINE TANK ON-SITE, BURIED UNDER THE GROUND, THAT THE OPERATOR USED.

AND WE PUT ALL THE AREAS TOGETHER REQUIRING REMEDIATION. THIS IS BASICALLY WHAT IT LOOKS LIKE, AND THIS IS JUST FOR SURFACE SOILS.

FOR SURFACE WATER, WE'LL GO BACK TO THIS ONE MAP HERE, WE'RE TALKING ABOUT FROM SURFACE DOWN TO 3-5 FEET IN DEPTH WOULD BE THE DEPTH THAT WE. AS FAR AS SURFACE WATER IS CONCERNED, WE FOUND THAT THIS DRAINAGE DITCH HERE THAT LEADS BACK TO THIS DIKED POND WILL ALSO REQUIRE REMEDIATION. THAT ENTAILS PUMPING OUT THAT WATER, TREATING THE WATER, EXCAVATING THE CONTAMINATED SOILS AND TREATING THOSE SOILS. SO THAT WILL ADDRESS SURFACE WATER AND SEDIMENTS IN THIS AREA. WE DID FIND SOME CONTAMINATION IN THE SWAMP AREA BACK HERE WHICH, AGAIN, WE WILL ADDRESS THROUGH EXCAVATION AND TREATING THAT SOIL AS WELL AS SURFACE WATER.

AS FAR AS GROUNDWATER CONTAMINATION IS CONCERNED.... ALTHOUGH THIS IDENTIFIES FOR CREOSOTE CONTAMINATION IN THE UPPER AQUIFER, IT'S BASICALLY THE SAME AREA FOR ALL THE CONTAMINANTS WE LOOK AT.

WE FOUND THAT THE UPPER AQUIFER AT THE SITE FLOWS RADIALLY IN ALL DIRECTIONS FROM THE SITE. THIS IS BASICALLY DUE TO: 1) IT BEING A HIGH POINT IN THE AREA AND 2) THE HIGH PERCENTAGE OF SAND PRESENT AT THE SITE ALLOWS A HIGH PERCOLATION RATE IN THE GROUND.

AND FOR THE DEEPER AQUIFER, WE ONLY FOUND A SMALL AREA OF CONTAMINATION, WHICH IS RIGHT HERE { }. THAT'S BASICALLY DUE TO WHAT WE BELIEVE IS AN ON-SITE PRODUCTION WELL USED DURING THE OPERATION OF THE FACILITY, CONTAMINANTS LEAKING DOWN THE WELL CASING AND GETTING INTO THE DEEPER AQUIFER. THAT'S WHY IT'S SO LOCALIZED.

ONE OF THE FINDINGS OF ONE OF THE TASKS OF THE REMEDIAL INVESTIGATION IS TO QUANTIFY THE AMOUNT OF MATERIAL (SOILS/GROUNDWATER) CONTAMINATED, AND THIS TABLE { } PRESENTS WHAT WE FEEL ARE THE MAXIMUM AND MINIMUM AMOUNTS OF CONTAMINATED MATERIAL OUT THERE AS WELL AS AN AVERAGE.

THAT BASICALLY PRESENTS THE FINDINGS OF THE REMEDIAL INVESTIGATION. THE REMEDIAL INVESTIGATION HAD THREE BASIC QUESTIONS WE TRIED TO ANSWER: 1) WHAT ARE THE CONTAMINANTS OF CONCERN AT THE SITE? 2) WHAT CONCENTRATION OF THE CONTAMINANTS? 3) HOW FAR FROM THE SITE HAS THE CONTAMINATION MIGRATED? THIS INFORMATION IS FED INTO THE FEASIBILITY STUDY. THE FEASIBILITY STUDY EVALUATES, BASED ON INFORMATION FROM THE REMEDIAL INVESTIGATION, THE TYPES OF CLEAN UP ALTERNATIVES THAT ARE FEASIBLE AT THE SITE.

GOING FROM A LIST OF APPROXIMATELY FORTY TYPES OF REMEDIATION, WE NARROWED IT DOWN TO: FOUR FOR ADDRESSING CONTAMINATED SOILS AND SEDIMENTS AND FIVE FOR ADDRESSING SURFACE WATER AND GROUNDWATER. ONE OF THE ALTERNATIVES THAT WE HAVE TO CONSIDER AND CARRY ALL THE WAY THROUGH THE EVALUATION IS WHAT WE CALL A NO ACTION ALTERNATIVE. THAT'S BASICALLY JUST TO LET THE SITE SIT THERE AND MONITOR THE CONTAMINATION AND THE RATE AT WHICH THE CONTAMINATION MIGRATES. WE USE THIS AS A BASE LINE MEASURING POINT TO MEASURE WHAT GOOD OR BENEFIT WE GET FROM OUR REMEDIAL ALTERNATIVES.

FOR THE CONTAMINATED SOILS THESE WERE THE FOUR ALTERNATIVES THAT WERE EVALUATED IN DETAIL:

1S AGAIN, NO ACTION EVALUATION TO PRESENT THE BASE LINE MEASURING STICK.

THE OTHER THREE ARE ACTUAL CLEAN UP ALTERNATIVES:

2S IS BASICALLY CAPPING THE CONTAMINATED AREA WITH A SOIL CAP;

3S AN EXCAVATION AND SOIL WASHING PROCESS

4S AGAIN, WE'D BE DIGGING UP THE CONTAMINATED SOILS AND PUTTING IT THROUGH A LOW-TEMPERATURE DESORPTION/ABSORPTION PROCESS.

WHERE 1S AND 2S ARE NOT PERMANENT CLEAN-UPS. OBVIOUSLY, UNDER NO ACTION, THE CONTAMINANTS WOULD REMAIN IN PLACE, AND UNDER 2S, THE CONTAMINANTS WOULD REMAIN IN PLACE ALTHOUGH THERE WOULD BE A PROTECTIVE CAP PLACED OVER THEM WHICH WOULD PREVENT RAIN BASICALLY FROM INFILTRATING THE SOILS AND HELPING SPREAD CONTAMINANTS INTO THE GROUNDWATER.

3S AND 4S ARE BOTH PERMANENT REMEDIES; THEY WILL REMEDIATE THE SITE AND REMOVE THE CONTAMINATION ON A PERMANENT BASIS.

OVER HERE { } ARE THE COST AVERAGES FOR EACH REMEDIATION; THIS IS FOR SOILS AND SEDIMENTS.

THESE NUMBERS ARE BASED ON THAT PREVIOUS OVERHEAD { } THAT PRESENTED THE MAX/MIN VOLUME SO THE COST IS BASED ON VOLUMES OF MATERIALS TREATED.

FOR GROUNDWATER AND SURFACE WATER { }, AGAIN WE LOOK AT FIVE ALTERNATIVES IN DETAIL. THE FIRST ONE IS NO ACTION; THAT PRESENTS US WITH A BASE LINE TO MEASURE THE ALTERNATIVES, THE BENEFITS TO GAIN FROM THE OTHER ALTERNATIVES.

2W THROUGH 5W ARE BASICALLY THE SAME THING, THE ONLY DIFFERENCE IS...; THEY ARE THE SAME IN THE PROCESS THAT WE ARE WITHDRAWING OR EXTRACTING WATER.

Q: I DON'T UNDERSTAND THOSE FIGURES.

A: THE COST DOLLARS? I'LL GET TO THOSE.

Q: I MEAN, $3395 FOR WHAT?

A: OK, THOSE ARE HUNDREDS OF THOUSANDS OF DOLLARS. SO THE FIRST NUMBER WOULD BE $592,000. WE'RE TALKING AGAIN IN MILLIONS OF DOLLARS HERE, SO WE'RE TALKING ABOUT A RANGE BETWEEN: THE HIGH WOULD BE 2.8 MILLION TO, OR THE LOW 2.8 MILLION TO A HIGH OF 26 MILLION.

2W THROUGH 5W, FOR WITHDRAWING OR EXCAVATING BOTH SURFACE WATER AND GROUNDWATER, AND THE ONLY DIFFERENCE BETWEEN THESE ALTERNATIVES IS THE DEGREE WE TREAT THAT WATER.

WE REALLY HAVEN'T, AS FAR AS SELECTING A SPECIFIC TREATMENT, WE HAVEN'T DONE THAT, AND WE WILL DO THAT AFTER WE TALK WITH LOCAL SEWER AUTHORITIES AND SEE IF THEY WILL ACCEPT THE WATER EITHER WITH SOME TYPE OF TREATMENT OR WITH NO TREATMENT. WE HAVE NOT TALKED WITH THE LOCAL SEWER TREATMENT PLANT. WE DON'T KNOW WITH REGARDS TO THAT.

THERE ARE SOME OTHER ODDS AND ENDS THAT NEED ADDRESSING ON THE SITE, AND THESE ARE NOT IN MILLIONS OF DOLLARS { }; THESE ARE THE ACTUAL PRICE TAGS, THAT WE ESTIMATED, TO DEAL WITH, TO DEAL WITH THE SITUATION ON-SITE. WE FOUND WHAT WE BELIEVE IS ASBESTOS-CONTAINING PIPE INSULATION, WHAT LOOKED LIKE CCA-CHROMIUM, COPPER CHROMIUM ARSENIC CRYSTALS, AND WHAT WAS LEFT BEHIND FROM ONE OF OUR EMERGENCY RESPONSES, WHICH IS BASICALLY A PILE OF TEN CUBIC YARDS OF SOLIDIFIED CREOSOTE WHICH REMAINS ON-SITE, AND THEN THE PIPING AND TANKS ON-SITE AS WELL.

OKAY, THIS IS BASICALLY WHAT'S PRESENTED IN THE FEASIBILITY STUDY { }; THIS WAS DONE BY THE AGENCY'S CONTRACTOR. THE LAST PART, WHICH IS THE ACTUAL SELECTING OF THE REMEDY WHICH IS LEFT UP TO THE AGENCY, AND WHAT THE AGENCY HAS IDENTIFIED AS A PREFERRED ALTERNATIVE: I WILL START WITH WHAT'S UP HERE. FOR THE CCA CRYSTALS AND CREOSOTE CONTAMINATED MATERIAL; THOSE TWO MATERIALS WE ARE PROPOSING TO DISPOSE OFF-SITE AT A RCRA-APPROVED HAZARDOUS LANDFILL. THERE'S TWO OF THEM WE'RE LOOKING AT:

ONE IS OUT OVER IN PINEWOOD, SOUTH CAROLINA, GFX HAZARDOUS LANDFILL , AND THE OTHER ONE WE LOOKED AT WOULD BE EMILE, ALABAMA, WHICH WOULD BE ANOTHER HAZARDOUS WASTE LANDFILL.

FOR THE ASBESTOS-CONTAINING PIPING INSULATION, WE HAVE BEEN INFORMED THAT CUMBERLAND COUNTY LANDFILL CAN ACCEPT THAT, AND THEREFORE WE ARE PROPOSING TO REMOVE THAT AND DISPOSE OF IT AT THE LOCAL LANDFILL.

AND, FOR THE LIQUIDS CONTAINED IN THE TANKS, WE WOULD PREFER TO FIND A WOOD-TREATER WHO WOULD BE WILLING TO ACCEPT THAT MATERIAL, BUT IN THE LIKELIHOOD THAT WE WOULD NOT FIND SOMEBODY, WE WOULD BE PROPOSING TO TREAT THAT WATER ON-SITE THROUGH THE TREATMENT SYSTEM ESTABLISHED FOR THE GROUND WATER AND SURFACE WATER, SO THAT WOULD BE 1L.

Q: HOW CAN THESE PRICE ESTIMATES BE MADE WITHOUT ACTUAL COSTS HAVING BEEN ACCRUED AND WITHOUT KNOWING IF THE SEWAGE TREATMENT PLANT WOULD ACCEPT THE WASTE?

A: THESE PRICES ARE BASED ON WORST-CASE SCENARIOS.

AND THEN, ONCE WE EMPTY THE TANKS, WE CLEAN THEM, TRY TO RENDER THEM NON-HAZARDOUS AND IDEALLY WE'D BE ABLE TO SELL THEM FOR SCRAP METAL. AND IF WE'RE ABLE TO DO THAT, WE'D MAKE $112,000 (THAT'S WHY THE NEGATIVE SIGN IS UP THERE); IT WOULDN'T COST US ANYTHING TO DO THAT. THE GOVERNMENT WOULD MAKE MONEY FOR ONCE. IF WE CAN'T RENDER IT NON-HAZARDOUS OR WE CAN'T FIND A SCRAP METAL DEALER TO ACCEPT THAT METAL AFTER IT'S BEEN CLEAN, WE COULD DISPOSE OF THAT AT THE COUNTY LANDFILL, AND THE COST OF THAT WOULD BE APPROXIMATELY $87,000.

FOR SOILS AND SEDIMENTS, THE PREFERRED OR PROPOSED CLEAN-UP METHOD IS 3S, SO WE'RE TALKING ABOUT, AS A MINIMUM COST, 4.3 MILLION AND, ON THE HIGH END, 20.9 MILLION TO CLEAN UP THE SOIL. THERE'S ONE PIECE OF INFORMATION LACKING THAT WE'RE WORKING WITH RIGHT NOW, OR NOT WORKING WITH UNFORTUNATELY, AND THAT IS, WE HAVEN'T PERFORMED A TREATABILITY STUDY TO MAKE SURE THAT THE SOIL-WASHING PROCESS WILL WORK. SO, AS A FALL-BACK POSITION, WE HAVE IDENTIFIED 4S AS A FALL-BACK POSITION IN CASE WE CANNOT FIND A SOIL WASHING PROCESS THAT WILL WORK.

WHAT THE THERMAL PROCESS BASICALLY MEANS IS TO PROCESS THE SOILS AND SEDIMENTS THROUGH A LOW-TEMPERATURE FURNACE AT TEMPERATURES HIGH ENOUGH TO VOLATILIZE THE CREOSOTE, TO CATCH THE EXHAUST GAS COMING OFF OF THAT AND THEN TREATING IT WITH A SCRUBBER AND REMOVING CONTAMINANTS THAT WAY. UNFORTUNATELY, THE THERMAL PROCESS ITSELF DOES NOT ADDRESS METALS. FOLLOWING THAT THERMAL PROCESS, WE'D EITHER USE A FILTRATION PROCESS WHERE WE'D BE MIXING WITH SOME TYPE OF CONCRETE OR SIMILAR MATERIAL AND MAKING A CONCRETE SLAB OR MONOLITH. OR USE A SOIL-WASHING PROCESS TO REMOVE THE SOIL. THE PRICE TAG FOR THAT, FOR 4S, RANGES FROM OUR ESTIMATES FROM 5.6 MILLION TO 26.1 MILLION.

FOR THE SURFACE WATER AND GROUND WATER, AGAIN, RIGHT NOW WE ARE PROPOSING TO PUMP THE SURFACE WATER AS WELL AS THE CONTAMINATED GROUNDWATER. OUR PREFERRED DISCHARGE LOCATION OR DISCHARGE POINT WOULD BE TO THE LOCAL SEWER SYSTEM. THAT WOULD BE THE LESS COSTLY, CHEAPEST WAY TO DO IT. FOLLOWING NEGOTIATIONS WITH THEM, WE'D HAVE TO NEGOTIATE HOW MUCH WE COULD DISCHARGE TO THEM AND WHAT LEVELS OF CONTAMINANTS, IF ANY, WOULD REMAIN IN THAT WATER WE DISCHARGE. THEY MIGHT REQUIRE TO CLEAN IT UP TO CLEAN WATER SPECS. ALL THAT AGAIN IS YET TO BE DETERMINED.

Q: WHICH NUMBER IS THAT IN THE PREFERRED ALTERNATIVES?

A: IT WOULD BE, IT IS THE PREFERRED ALTERNATIVE: TO DISCHARGE TO A POTW (PUBLICLY-OWNED TREATMENT WORKS).

IF THE SEWER SYSTEM WOULD NOT ACCEPT IT, OUR OTHER ALTERNATIVES, OUR OTHER DISCHARGE ALTERNATIVE IS TO DISCHARGE IT TO A NEARBY SURFACE STREAM, UNDER WHAT'S CALLED AN NPDES PERMIT (NATIONAL POLLUTION DISCHARGE AND ELIMINATION SYSTEM). IT HAS IT'S OWN CRITERIA TO PROTECT SURFACE WATER FROM CONTAMINANTS, AND WE'D HAVE TO MEET WHATEVER LEVEL THEY SET FOR THAT DISCHARGED WATER.

SO, WE'RE RANGING FROM A MINIMUM COST OF APPROXIMATELY 2.8 MILLION UP TO 3.5 MILLION TO TREAT SURFACE WATER AND GROUNDWATER, AND THESE COSTS ARE BASED ON THE ASSUMPTION THAT WE WILL HAVE TO BUILD SOME TYPE OF TREATMENT PLANT ON-SITE TO TREAT THIS WATER.

Q: IF YOU DID AIR STRIPPING, WOULD YOU HAVE TO MEET EMISSION REQUIREMENTS?

A: WE'D HAVE TO MEET THEIR SPECS. SUPERFUND, ALTHOUGH WE HAVE STATE AND FEDERAL PERMITS, ONE THING SUPERFUND DOESN'T ACTUALLY HAVE TO DO IS GET THOSE PERMITS; WE HAVE TO MEET THE TECHNICAL REQUIREMENTS OF THE PERMITS. WE WOULD MEET ALL REQUIREMENTS NECESSARY.

THIS IS JUST A QUICK OVERVIEW OF THE SOIL WASHING PROCESS { }. BASICALLY IT ENTAILS USING A HIGH PRESSURE WASHING SYSTEM TO BREAK UP LARGE AGGREGATES OF MATERIAL, SOIL MATERIALS, AND WASH AWAY THE SLUDGE,

THE CONTAMINANTS FROM THE SOIL MATERIAL. CLEAN SOIL, IF IT'S HEAVY ENOUGH, WOULD FALL OUT DUE TO GRAVITY AND BE PUT BACK IN PLACE. THE CONTAMINANTS, CREOSOTE AS WELL AS METALS, WOULD COME INTO SOLUTION OR BE REMOVED AS SUSPENDED SOLIDS IN THE WASTE WATER. THAT WASTE WATER WOULD THEN BE BIOLOGICALLY TREATED TO REMOVE THE CREOSOTE AND WE'D USE SOME TYPE OF POPULATION/SEDIMENTATION/FIXATION PROCESS TO REMOVE THE METALS. THEN THAT WATER CAN BE RECYCLED THROUGH THE SYSTEM.

Q: HOW IS THIS PROCESS GOING TO WORK AT THIS LARGE SCALE SITE?

A: IT'S BEING USED AS A PILOT STUDY RIGHT NOW AT A SUPERFUND SITE UP IN MINNESOTA. IT'S BEEN SHUT DOWN FOR THE WINTER. THE RESULTS SEEM POSITIVE. AGAIN, WE HAVEN'T DONE A TREATABILITY STUDY AND ONE OF THE MAIN FACTORS THAT WOULD INFLUENCE IT'S ACCEPTABILITY HERE WOULD BE ???, BASICALLY THE RATIO BETWEEN SAND AND CLAY THAT IS IN THE GROUND. IF WE HAVE A HIGH CLAY CONTENT, THEN WE'D HAVE TO USE THE OTHER ALTERNATIVE, WHICH WAS 4S WHICH WILL BE THE THERMAL PROCESS WHICH WOULD BE WHAT WE WOULD BE PROPOSING.

UNFORTUNATELY, I DID NOT ITEMIZE THE TOTAL COST. FOR SOILS, WE'RE USING 10.9 MILLION AS THE AVERAGE COST; 3.4 MILLION FOR ADDRESSING SURFACE WATER AND GROUNDWATER; IF WE CAN FIND A SCRAP METAL DEALER WHO WILL TAKE THE METAL, THESE METALS HERE WOULDN'T COST ANYTHING, THEY'D KIND OF BALANCE EACH OTHER, BUT OTHERWISE WE'RE TALKING ABOUT CLOSE TO 200,000 FOR REMEDIATION OF THESE ITEMS ON THIS OVERHEAD { }.

ARE THERE ANY QUESTIONS?

Q: WHEN CAN WE SEE SOME MOVEMENT OR ACTIVITY AT THE SITE?

A: TONIGHT STARTS, BASICALLY A, STARTS A THREE WEEK COMMENT PERIOD WHERE THE AGENCY ENCOURAGES THE PUBLIC TO EXPRESS THERE FEELINGS ONE WAY OR THE OTHER ABOUT WHAT WE PROPOSE AS A REMEDIAL ALTERNATIVE. FOLLOWING THE CLOSURE OF THAT PUBLIC COMMENT PERIOD, WE (THE AGENCY) PREPARES A RESPONSIVENESS SUMMARY WHERE WE RESPOND TO EACH COMMENT WE RECEIVE. THAT USUALLY TAKES ANOTHER TWO WEEKS. THEN WE PREPARE WHAT'S CALLED A RECORD OF DECISION, WE CALL IS A ROD (ANOTHER GOVERNMENT ACRONYM). THE RECORD OF DECISION IS A DECISION DOCUMENT; IT'S SIGNED BY THE REGIONAL ADMINISTRATOR, AND IT SETS FORTH THE ACTUAL CLEANUP THAT THE AGENCY WILL IMPLEMENT AT THE SITE. AND THAT COULD TAKE UP TO A MONTH. SINCE THIS IS A SUPERFUND SITE... IN THE AGENCY, WE HAVE TWO KINDS OF SUPERFUND SITES: ONE IS ENFORCEMENT, WHERE WE KNOW PRP'S, OR POTENTIALLY RESPONSIBLE PARTIES - WE HAVE FOLKS WHO CREATED THE CONTAMINATION AND THEY ARE PAYING FOR IT; WE HAVE SITES SUCH AS CAPE FEAR WOOD PRESERVING, WHICH IS CALLED FUND-LEAD, AND WE HAVEN'T IDENTIFIED ANY RESPONSIBLE PARTY FOR THE CONTAMINANTS ON-SITE OR THE ENTITY WHO CREATED IT IS NO LONGER AROUND OR DOESN'T HAVE THE MONEY TO PAY FOR IT, SO SUPERFUND PAYS FOR IT. IN SITES LIKE THIS, WE NEED A MATCHING 10% SHARE FROM THE STATE. WE HAVE TO GO THROUGH THAT NEGOTIATION WITH THE STATE AND THAT NEGOTIATION RESULTS IN WHAT'S CALLED A SUPERFUND STATE CONTRACT, AND WE'RE EXPECTING TO TAKE TWO TO THREE MONTHS TO IRON OUT THE LANGUAGE

Q: FOLLOWING THE RECORD OF DECISION?

YES, A RECORD OF DECISION. WE FIRST HAVE TO GET THE STATE'S CONCURRENCE ON THE REMEDY SELECTED. IF THEY DO NOT CONCUR, THEY DO NOT MATCH THE FUNDS AND WE DON'T CLEAN UP THE SITE. CONGRESS HAS MANDATED THAT WE GET THE 10% MATCHING FUNDS BEFORE WE DO ANYTHING BEYOND THIS POINT.

Q: DOES YOUR REPORT HERE TAKE IN CONSIDERATION STATE OFFICIALS SAYING THAT CONTAMINANT.... OR SOLELY ON THE KNOWLEDGE...

A: WE HAVE ALL THE DOCUMENTS THAT WE GENERATED TO THE STATE FOR REVIEW. THEY'RE USING THE SAME INFORMATION WE'RE USING. THESE NUMBERS ARE GENERATED BY OUR CONTRACTOR WHO DID THE ACTUAL STUDY. THERE'S NO REASON WHY WE WOULD DOUBT THIS INFORMATION. WHERE THEIR ACTUAL DECISION ROLE COME IN IS WHAT TYPE OF REMEDY THEY WOULD LIKE TO SEE AT THE SITE. BUT THEY WOULD BE USING THE SAME INFORMATION.

Q: WHO IS THE CONTRACTOR?

A: THE CONTRACTOR IS CAMP, DRESSER & MCKEE. THEY'RE A NATIONAL A & E (ARCHITECTURE AND ENGINEERING) FIRM. WE CALL THEM A REM II CONTRACTOR. THEY'VE DONE WORK FOR THE AGENCY EAST OF THE MISSISSIPPI. THEIR HEADQUARTERS IS OUTSIDE WASHINGTON, BUT THEY HAVE A LOCAL OFFICE IN ATLANTA, AND THAT'S THE OFFICE WE DEAL WITH.

Q: HOW RELIABLE ARE THE RESULTS THAT CAMP, DRESSER & MCKEE GENERATED?

A: WE HAVE ABOUT THREE OR FOUR CONTRACTORS WE RELY ON TO DO THIS KIND OF WORK.

Q: IF THE DEGREE OF CONTAMINANTS THAT YOU HAVE SHOWN HERE TONIGHT, IN YOUR ALL BACKGROUND AND EXPERIENCE, WHAT IS THE POSSIBILITY... IS IT AT A LEVEL WHERE THE CONTAMINANTS PROPOSE A HEALTH THREAT AND WHAT IS THE POSSIBILITY OF THE NO ACTION ALTERNATIVE?

A: MY FEELING FROM WHAT I'VE HEARD FROM THE STATE IS THAT THEY PREFER SOME KIND OF PERMANENT REMEDY AT THE SITE, NOT THE NO ACTION ALTERNATIVE. THE NO ACTION ALTERNATIVE, FOR AT LEAST SURFACE SOILS, IS NOT ACCEPTABLE FOR HEALTH BASED REASONS.

Q: WHAT ABOUT THE WATER?

A: AGAIN, THE GROUNDWATER DOES NOT EXCEED CLEANUP STANDARDS, AND THEREFORE WE WOULD ENCOURAGE CLEANUP, NOT KNOWING WHAT THE FUTURE HOLDS FOR THAT AREA. IT COULD GO ONE WAY OR THE OTHER. IF IT GOES RESIDENTIAL, WE WOULD HAVE TO CLEAN IT UP; IF IT STAYS AS IT IS, THERE'S NOT MUCH OF A PUSH TO CLEAN IT UP. IT'S NOT GOING TO AFFECT ANYONE.

Q: IS THERE ANY IMMEDIATE DANGER WITHIN THE AREA?

A: FROM GROUNDWATER? NO, GROUNDWATER IS VERY LOCALIZED. THE ONE WELL THAT WAS CONTAMINATED, I BELIEVE THE OWNER/OPERATOR DUG THAT PERSON A NEW WELL.

Q: ON THAT FIGURE (2-6) DOES THAT BIG CIRCLE REPRESENT THE UPPER WATER SYSTEM OR LOWER OR BOTH?

A: THIS BIG CIRCLE? IT WAS THE SURFICIAL, THE UPPER AQUIFER.

Q: AND WHAT DO YOU CALL UPPER AS FAR AS DEPTH?

A: I THINK IT GOES DOWN TO BETWEEN 30 AND 50 FEET AND THEN WE FIND A CONFINING ZONE WHICH SEPARATES THE UPPER AQUIFER FROM THE DEEPER AQUIFER.

A: OKAY, THIS IS THE CONTAMINANTS FOUND IN THE UPPER AQUIFER.

Q: HOW FAR HAS THE CONTAMINATION GONE?

A: THIS IS THE RESIDENCE WHERE WE FOUND CONTAMINATION IN THE PERSON'S WELL. I WOULD GUESS, LOOKING AT THIS SCALE, IT'S ABOUT 250 FEET WEST.

Q: HOW FAR SOUTH HAS THE CONTAMINATION....

A: THIS SHOULD BE THE CONDITION OF THE WELLS; THEY WOULD SHOW UP CLEAN.

A: I WAS UNDER THE ASSUMPTION THAT WE HAD A PAIR OF WELLS THERE.

Q: IS THAT WELL A DEEP OR SHALLOW WELL?

A: I'M NOT SURE IF THAT'S DEEP OR SHALLOW.

Q:

A: I DON'T HAVE THAT INFORMATION OFF-HAND, BUT HOPEFULLY I HAVE IT HERE.

Q:

A: I BELIEVE WE FOUND... WHERE THAT 400 FEET IS? THERE SHOULD BE TWO HERE, AND I... THAT 400 REPRESENTS WHAT WE FOUND IN THE SHALLOW WELL. SO, SINCE WE'RE TALKING ABOUT THE UPPER AQUIFER, THAT'S WHY THERE'S NO DOT HERE; WE ONLY HAVE A DEEP WELL THERE. SO WE FOUND 400 UG/L OF CONTAMINANTS (PAHS). AND THIS FIGURE { } -- THAT OVAL IS COMPUTER IS COMPUTER GENERATED FROM GROUNDWATER MODELING PROGRAM.

Q: HOW LONG HAS IT BEEN SINCE THAT WELL'S BEEN SAMPLED?

A: I'D HAVE TO SAY AUGUST 87.

Q:

A: THAT MIGHT BE THE DATE OF THE REPORT. WE PERFORMED THE REMEDIAL INVESTIGATION DURING THE SUMMER OF 1987. SO IT WAS SOME TIME DURING THAT SUMMER. MR. JACKSON'S PRIVATE WELL, WHICH WAS A SHALLOW, HAND DUG WELL, WHICH IS NEAR THIS POINT WAS CONTAMINATED BACK IN 1980 OR 1979. AND, IN RESPONSE, HE WAS PROVIDED A NEW WELL.

Q: LET ME ASK YOU THIS: HOW FAR HAS THE CONTAMINATION MOVED SINCE 1979?

THIS WOULD BE, THIS FIGURE IS BASED ON DATA COLLECTED THE SUMMER OF 87.

Q: CONTAMINATION WAS FOUND IN 1979/1980 ACROSS THE ROAD?

A: AND WE FOUND CONTAMINATION TWO SUMMERS AGO AND THIS 400 REPRESENTS THAT CONTAMINATION. AND BASED ON COMPUTER MODELING, WE HAVE PROJECTED THAT THE CONTAMINANTS HAVE MIGRATED THIS FAR, AS OF THE SUMMER OF 87. I THINK GROUNDWATER HORIZONTAL VELOCITY IS, I WANT TO SAY, IS 15 FT/YR -- THE RATE IT'S MOVING.

Q: 50 FT/YR?

A: 15 FT/YR IS WHAT WE'VE CALCULATED THE WATER IS MOVING. THAT'S NOT TO SAY THE CONTAMINATION IS MOVING AT THAT RATE; IT'S JUST SAYING THE WATER IS MOVING AT THAT RATE. CONTAMINANTS DON'T MOVE AS QUICKLY AS THE WATER DOES. SO, IF ANYTHING, IT MIGHT BE A TAD LARGER THAN THIS AREA RIGHT NOW, BUT IT WOULDN'T, COST-WISE, IT WOULDN'T AFFECT THE COST. AGAIN, WE'RE DEALING WITH A MAXIMUM/MINIMUM RANGE, AND I'M SURE IT WILL FALL WITHIN THAT

RANGE OF VOLUME WITH THE ESTIMATED COST IT'S BASED ON.

Q: WITH CONTAMINANTS ON BOTH SIDE OF THE ROAD AND A DITCH ALONG SIDE THE ROAD THAT CROSSES UNDERNEATH THE ROAD.

A: THAT WOULD BE THIS RIGHT HERE { }.

Q: THAT DITCH I THOUGHT GOES ON DOWN TO A LAKE, IS THERE CONTAMINATION FROM THE SITE IN THE LAKE AND DITCH SINCE THE MAJORITY OF FLOW APPEARS TO GO IN THAT DIRECTION.

A: WE DO NOT FIND, YOU KNOW OUR REMEDIAL INVESTIGATION, WE DID NOT FIND CONTAMINANTS IN THIS AREA, WHICH WAS BASICALLY ON THE OTHER SIDE OF REILLY ROAD. TO ANSWER THE OTHER QUESTION, WE DON'T KNOW.

I'M NOT SAYING NO CONTAMINATION HAS GONE THAT FAR, BUT WE DON'T HAVE INFORMATION TO JUDGE ONE WAY OR THE OTHER. ALL WE CAN DO IS WORK ON THE INFORMATION WE HAVE, ACCORDING TO THE SAMPLES COLLECTED DURING THE REMEDIAL INVESTIGATION, WE DID NOT FIND CONTAMINATION IN THAT DITCH ON THE OTHER SIDE OF THE ROAD.

Q: I THINK IT WAS ABOUT 25 YEARS AGO, THERE WAS A POND AND ALL THE FISH WERE KILLED IN THE POND BY CONTAMINATION.

JB: BACK HERE SOMEWHERE?

Q: DID YOU FIND ANY CONTAMINATION IN THAT DIRECTION?

A: WE DID FIND CONTAMINATION THROUGH THIS DRAINAGE DITCH AND IN THE DIKED POND THAT IS AN AREA TARGETED FOR REMEDIATION. WE DID NOT FIND SURFACE WATER OR SEDIMENT CONTAMINATION IN THIS DITCH ON THIS SIDE, AND THEREFORE IT WAS NOT IDENTIFIED AS AN AREA FOR REMEDIATION. AS FAR AS A POND IN THIS AREA, WE HAVE NO INFORMATION TO MAKE ONE JUDGEMENT OR THE OTHER ON THAT.

ANY OTHER QUESTIONS?

Q: HOW ABOUT SOUTHGATE HERE?

A: ALL THE SUPPLY WELLS IN THAT AREA WERE TESTED, YES. AND WE FOUND... THE ONLY THING WE FOUND IN THE WELLS WERE ELEVATED LEVELS OF TRIHALOMETHANES (THMS).

Q: DID YOU FIND A SOURCE?

A: NO, NO, WE WEREN'T ABLE TO IDENTIFY THAT TO ANY SOURCE.

Q: IT WAS ONE OF THE SUPPLY WELLS?

A: IT WAS ONE OF THE SUPPLY WELLS IN SOUTHGATE SUBDIVISION, AND WE FOUND THM. THM IS TRIHALOMETHANE EITHER CHLORINE OR FLUORINE: TRICHLORO- OR TRIFLUORMETHANE.

Q: THAT WAS IN 87.

A: THAT WAS BACK IN 87.

Q: AND YOU TESTED FOR WHAT?

A: WE TESTED IT LOOKING FOR CONTAMINANTS FROM THIS SITE. THE LEVELS WERE BELOW DRINKING WATER STANDARDS. WE DID IDENTIFY OR NOTIFY THE OWNER/OPERATOR OF THE WELL AND THE LOCAL GOVERNMENT OF OUR FINDING AND AS FAR AS SUPERFUND PROGRAM GOES, THAT'S AS FAR AS WE CARRY IT. WE IDENTIFY THE RIGHT FOLKS HOPEFULLY AND THAT'S AS FAR AS WE GO WITH THAT.

Q:

A: NO TO THIS SITE, NO.

Q: DO LOCAL OFFICIALS KNOW WHAT HAS BEEN FOUND AT THE SITE?

A: AS FAR AS THE LOCAL STATE OFFICES, YES. THE COUNTY OFFICES... I HAVE NOT BEEN IN DIRECT CONTACT WITH THEM. WE HAVE ESTABLISHED AN INFORMATION REPOSITORY/ADMINISTRATIVE RECORD AT THE PUBLIC LIBRARY WHICH CONTAINS ALL THE DOCUMENTS INCLUDING THE INFORMATION I REVIEWED TONIGHT.

JB: ANY OTHER QUESTIONS. I THANK YOU AND APPRECIATE YOU FOR COMING. I HOPE CLEANUP GETS GOING AS QUICKLY AS POSSIBLE.

END OF TAPE

#TA

TABLE 1
SURFICIAL SOIL SAMPLING DATA SUMMARY
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE,NORTH CAROLINA

	FREQUENCY OF DETECTION
INORGANIC CHEMICALS (MG/KG)	
ALUMINUM	99
ARSENIC	68
BARIUM	52
CHROMIUM	68
COPPER	69
IRON	100
LEAD	39
MAGNESIUM	62
ORGANIC CHEMICALS (UG/KG)	
BENZENE	6
TOLUENE	29
PAHS (MG/KG)	
ACENAPHTHENE	12
ACENAPHTHYLENE	16
ANTHRACENE	20
BENZO (A) ANTHRACENE	12
BENZO (B AND/OR K) FLUORANTHENE	26
BENZO (G,H,I) PERYLENE	12
BENZO (A) PYRENE	17
CHRYSENE	20
DIBENZO (A,H) ANTHRACENE	5
FLUORANTHENE	27
FLUORENE	18
INDENO (1,2,3-CD) PYRENE	12
NAPHTHALENE	11
PHENANTHRENE	15
PYRENE	29
TOTAL PAHS	53

	CONCENTRATION RANGE	BACKGROUND CONCENTRATION RANGE *
INORGANIC CHEMICALS (MG/KG)		
ALUMINUM	ND-14000	1600-2900
ARSENIC	ND-15000	ND
BARIUM	ND-110	ND-21
CHROMIUM	ND-1300	2.6-5.2
COPPER	ND-6100	ND-11
IRON	99-15000	1500-2400
LEAD	ND-270	ND-70
MAGNESIUM	ND-530	ND-210
ORGANIC CHEMICALS (UG/KG)		
BENZENE	ND-71	ND
TOLUENE	ND-1100	ND-390
PAHS (MG/KG)		
ACENAPHTHENE	ND-1300	ND
ACENAPHTHYLENE	ND-244	ND
ANTHRACENE	ND-24000	ND
BENZO (A) ANTHRACENE	ND-370	ND-0.072
BENZO (B AND/OR K) FLUORANTHENE	ND-560	ND-0.20
BENZO (G,H,I) PERYLENE	ND-13	ND-0.038
BENZO (A) PYRENE	ND-180	ND-0.085
CHRYSENE	ND-630	ND-0.090
DIBENZO (A,H) ANTHRACENE	ND-7.8	ND
FLUORANTHENE	ND-2600	ND-0.16
FLUORENE	ND-4100	ND
INDENO (1,2,3-CD) PYRENE	ND-18	ND-0.047
NAPHTHALENE	ND-390	ND
PHENANTHRENE	ND-8100	ND-0.039
PYRENE	ND-2200	ND-0.16
TOTAL PAHS	ND-37000	ND-0.89

ND = NOT DETECTED

* = BASED ON THE ANALYTICAL RESULTS FOR THE THREE BACKGROUND SURFICIAL SOIL SAMPLES (BCK-1, BCK-2, AND BCK-3).

TABLE 2
COMPARISON OF 1-FOOT AND 5-FOOT SOIL SAMPLE RESULTS
CAPE FEAR WOOD PROCESSING SITE
FAYETTEVILLE, NORTH CAROLINA

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)
AA8-01	1	2.3
AA8-05	5	2.4
A4-01	1	18
A4-05	5	-
A6-01	1	110
A6-05	5	8.6
A7-01	1	240
A7-05	5	120
B3-01	1	4.1
B3-05	5	7.1
B4-01	1	19
B4-05	5	12
C2-01	1	11
C2-05	5	8.7
C4-01	1	67
C4-05	5	6.4
C8-01	1	13
C8-05	5	-
D10-01	1	22
D10-05	5	-
E2-01	1	18
E2-05	5	7.1
G5-01	1	7.8
G5-05	5	4.5
SS3-01	1	230
SS3-05	5	240

SAMPLE	COPPER (MG/KG)	ARSENIC (MG/KG)
AA8-01	2.3	-
AA8-05	-	-
A4-01	4.8	9
A4-05	-	-
A6-01	27	41
A6-05	-	-
A7-01	78	58
A7-05	32	54
B3-01	3.3	-
B3-05	-	-
B4-01	3.6	7.9
B4-05	-	-
C2-01	4.8	9.6
C2-05	2.2	-
C4-01	13	22
C4-05	-	-
C8-01	15	-
C8-05	-	-
D10-01	-	-
D10-05	-	-
E2-01	8	14
E2-05	2.4	-
G5-01	6.8	8.9
G5-05	-	-
SS3-01	20	130
SS3-05	6.5	180

SAMPLE	TOTAL PAHS (MG/KG)	TOLUENE (UG/KG)	BENZENE (UG/KG)
AA8-01	-	-	-
AA8-05	0.5	-	-
A4-01	-	-	-
A4-05	0.3	-	-
A6-01	1300	-	-
A6-05	1.6	-	-
A7-01	12	-	-
A7-05	0.52	-	-
B3-01	-	-	-
B3-05	2.0	-	-
B4-01	9500	130	-
B4-05	210	150	-
C2-01	420	-	-
C2-05	130	-	-
C4-01	420	130	-
C4-05	1000	-	-
C8-01	-	87	-
C8-05	-	-	-
D10-01	-	-	-
D10-05	-	-	-
E2-01	-	-	-
E2-05	-	-	-
G5-01	0.013	55	-
G5-05	-	-	-
SS3-01	8.6	900	8
SS3-05	2.3	-	-

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)
SS15-01	1	4.5
SS15-05	5	3.2
SS28-01	1	1.9
SS28-05	5	2.4
EXT21-01	1	5.2
EXT21-05	5	-
EXT22-01	1	3.2
EXT22-05	5	-
EXT27-01	1	9
EXT27-05	5	-
EXT29-01	1	3.6
EXT29-05	5	4.2
EXT31-01	1	8.2
EXT31-05	5	2.3
EXT34-01	1	26
EXT34-05	5	-
EXT41-01	1	-
EXT41-05	5	-
DD9-01	1	56
DD9-05	5	20

SAMPLE	COPPER (MG/KG)	ARSENIC (MG/KG)
SS15-01	-	2.9
SS15-05	-	-
SS28-01	23	10
SS28-05	-	-
EXT21-01	-	1.2
EXT21-05	-	0.5
EXT22-01	-	-
EXT22-05	-	-
EXT27-01	8.8	77
EXT27-05	-	-
EXT29-01	6.4	1.5
EXT29-05	2.1	-
EXT31-01	7.7	8
EXT31-05	-	-
EXT34-01	7.7	5
EXT34-05	-	-
EXT41-01	-	-
EXT41-05	-	-
DD9-01	4.3	25
DD9-05	2.5	21

SAMPLE	TOTAL PAHS (MG/KG)	TOLUENE (UG/KG)	BENZENE (UG/KG)
SS15-01	0.9	-	-
SS15-05	0.3	-	-
SS28-01	-	-	-
SS28-05	0.4	-	-
EXT21-01	-	-	-
EXT21-05	-	-	-
EXT22-01	-	-	-
EXT22-05	-	-	-
EXT27-01	-	4	-
EXT27-05	-	-	-
EXT29-01	-	27	-
EXT29-05	-	-	-
EXT31-01	-	-	-
EXT31-05	2.0	-	-
EXT34-01	-	150	-
EXT34-05	-	-	-
EXT41-01	-	-	-
EXT41-05	-	-	-
DD9-01	1.3	230	-
DD9-05	0.50	-	-

- = NOT DETECTED.

TABLE 3
BOREHOLE SAMPLING DATA SUMMARY
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)	COPPER (MG/KG)	ARSENIC (MG/KG)	TOTAL PAHS (MG/KG)
BH1-S12	1	-	5	0.58	-
S13	3	12	-	-	0.6
S1	5	5.8	-	-	7.5
S2	7	5.4	-	-	0.3
S3	9	24	10	18	2.0
S4	11	12	-	-	280
S5	13	12	-	-	1.4
S6	15	10	-	-	0.3
S7	17	38	-	-	1.1
S8	19	8.5	-	-	0.7
S9	21	28	-	-	-
S10	23	14	-	-	8.2
S11	25	7.5	-	-	-
S14	31	27	-	-	-
S15	36	30	-	-	-
S16	41	10	-	-	-
S17	46	-	-	0.8	1.2
S18	51	10	2.6	0.6	-
S19	56	7.2	2.8	0.92	-
S20	61	-	2.4	-	-
S21	66	-	2.5	-	-

SAMPLE	TOLUENE	BENZENE
BH1-S12	-	-
S13	-	-
S1	-	-
S2	-	-
S3	8	4
S4	-	-
S5	-	-
S6	-	-
S7	-	-
S8	-	-
S9	-	-
S10	-	-
S11	-	-
S14	-	-
S15	-	-
S16	-	-
S17	-	-
S18	-	-
S19	-	-
S20	-	-
S21	-	-

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)	COPPER (MG/KG)	ARSENIC (MG/KG)	TOTAL PAHS (MG/KG)
BH2-S1	1	214	32	16	0.3
S2	3	9.8	-	-	-
S3	5	8.2	2.3	-	-
S4	7	13	2.6	-	210
S5	9	11	2.8	-	670
S6	11	8.4	-	-	22
S7	13	4.2	7	2	4.0
S8	15	5.2	-	-	0.5
S9	17	9	-	-	6.9
S10	19	5.4	-	-	2.1
S11	26	25	-	-	20.1
S12	31	20	2.4	-	6.5
S13	36	8.5	2.6	-	0.7
S14	41	6.9	2.7	-	13.6
S15	46	9.6	8.2	4.7	8.2
S16	51	5.5	23	-	0.096
S17	56	6.8	11	-	-
S18	61	-	2.6	-	-
S19	66	-	10	-	-

	TOLUENE	BENZENE
BH2-S1	-	-
S2	-	-
S3	-	-
S4	-	-
S5	-	-
S6	-	-
S7	-	-
S8	-	-
S9	300	17
S10	-	-
S11	-	-
S12	-	-
S13	-	-
S14	-	-
S15	70	-
S16	-	-
S17	-	-
S18	-	-
S19	-	-

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)	COPPER (MG/KG)	ARSENIC (MG/KG)	TOTAL PAHS (MG/KG)
BH3-S1	1	-	-	1.1	-
S2	3	5.2	-	0.68	-
S3	5	-	-	0.62	0.6
S4	7	14	2.5	7.7	-
S5	9	16	2.9	0.55	-
S6	11	15	-	0.75	0.3
S7	13	13	-	-	-
S8	15	13	-	0.58	-
S9	17	12	-	-	0.3
S10	19	10	-	-	0.8
S11	24	-	-	-	-
S12	29	17	2.3	-	-
S13	31	32	-	-	-
S14	33	6.5	-	-	-
S15	35	-	-	-	-
S16	39	8.9	-	-	-
S17	44	4.6	2.9	-	-
S18	49	-	-	2.5	0.3
S19	54	4.8	2.6	-	0.3
S20	59	7.6	8.8	1.8	-

	TOLUENE	BENZENE
BH3-S1	-	-
S2	-	-
S3	-	-
S4	36	-
S5	-	-
S6	-	-
S7	-	-
S8	-	-
S9	-	-
S10	-	-
S11	-	-
S12	10	-
S13	-	-
S14	-	-
S15	-	-
S16	-	-
S17	-	-
S18	-	-
S19	-	-
S20	-	-

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)	COPPER (MG/KG)	ARSENIC (MG/KG)	TOTAL PAHS (MG/KG)
BH4-S2	3	-	-	1.4	-
S3	5	6	-	-	-
S4	7	6.8	2.8	-	-
S5	9	6.3	-	-	1.8
S6	11	-	-	-	-
S7	13	-	-	-	-
S8	15	-	-	-	-
S9	17	-	-	-	0.3
S10	19	-	-	-	-
S11	21	-	-	-	-
S12	23	-	-	-	-
S13	25	-	-	-	-
S15	29	-	-	-	NA
S16	36	20	2.9	-	NA
S17	41	-	-	-	NA
S18	46	5.4	-	-	NA
S19	51	10	-	-	NA
S20	56	15	3.1	4.2	-
S21	61	2.8	-	-	-

SAMPLE	TOLUENE	BENZENE
BH4-S2	-	-
S3	-	-
S4	-	-
S5	-	-
S6	-	-
S7	-	-
S8	-	-
S9	-	-
S10	-	-
S11	-	-
S12	-	-
S13	-	-
S15	-	-
S16	-	-
S17	-	-
S18	-	-
S19	-	-
S20	25	-
S21	-	-

SAMPLE	APPROXIMATE DEPTH (FT)	CHROMIUM (MG/KG)	COPPER (MG/KG)	ARSENIC (MG/KG)	TOTAL PAHS (MG/KG)
BHBCK1-S1	1	11	-	9.1	-
S3	5	-	-	-	-
S5	9	-	-	-	-
S8	15	4.9	-	-	-
S11	21	17	-	-	-
S13	25	5.5	-	-	-
S17	33	88	3	1.6	-
S20	39	-	-	-	-
S23	45	9.6	-	8.5	-
S24	47	-	-	0.7	-
S30	59	2.8	-	-	-

	TOLUENE	BENZENE
BHBCK1-S1	6	-
S3	-	-
S5	-	-
S8	110	-
S11	-	-
S13	38	-
S17	66	-
S20	-	-
S23	12	-
S24	-	-
S30	-	-

- = NOT DETECTED
NA = NOT ANALYZED

TABLE 4
GRACE PARKER PROPERTY SAMPLING DATA SUMMARY
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

	GP-1	GP-2
INORGANIC CHEMICALS (MG/KG)		
ALUMINUM	2100	NA
ARSENIC	-	-
BARIUM	8.5	NA
CHROMIUM	4.1	-
COPPER	2	6
IRON	1400	NA
LEAD	-	NA
MAGNESIUM	250	NA

	GP-3	GP-4
INORGANIC CHEMICALS (MG/KG)		
ALUMINUM	NA	NA
ARSENIC	-	-
BARIUM	-	-
CHROMIUM	2.2	2.1
COPPER	4.4	6.3
IRON	NA	NA
LEAD	NA	NA
MAGNESIUM	NA	NA

	GP-1	GP-2
ORGANIC CHEMICALS (UG/KG)		
BENZENE	-	-
TOLUENE	150	-

	GP-3	GP-4
ORGANIC CHEMICALS (UG/KG)		
BENZENE	53	-
TOLUENE	-	-

PAHS	GP-1	GP-2
ACENAPHTHENE	-	-
ACENAPHTHYLENE	0.042	-
ANTHRACENE	0.010	-
BENZO (A) ANTHRACENE	0.14	-
BENZO (B AND/OR K) FLUORANTHENE	1.3	-
BENZO (G,H,I) PERYLENE	0.19	-
BENZO (A) PYRENE	0.44	-
CHRYSENE	0.20	-
DIBENZO (A,H) ANTHRACENE	0.068	-
FLUORANTHENE	0.12	-
FLUORENE	-	-
INDENO (1,2,3-CD) PYRENE	.35	-
NAPHTHALENE	-	-
PHENANTHRENE	-	-
PYRENE	0.20	-

PAHS	GP-3	GP-4
ACENAPHTHENE	-	-
ACENAPHTHYLENE	-	-
ANTHRACENE	-	-
BENZO (A) ANTHRACENE	-	-
BENZO (B AND/OR K) FLUORANTHENE	-	1.1
BENZO (G,H,I) PERYLENE	-	-
BENZO (A) PYRENE	-	0.3
CHRYSENE	-	-
DIBENZO (A,H) ANTHRACENE	-	-
FLUORANTHENE	-	0.3
FLUORENE	-	0.8
INDENO (1,2,3-CD) PYRENE	-	-
NAPHTHALENE	-	-
PHENANTHRENE	-	-
PYRENE	-	1.8

	GP-1	GP-2
TOTAL PAHS	3.2	-

	GP-3	GP-4
TOTAL PAHS	-	4.3

TABLE 8
SUMMARY OF CONTAMINATED MEDIA AND CLEANUP GOALS
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

MEDIA	SITE RELATED CONTAMINANTS EXCEEDING ARARS, RISK ASSESSMENT VALUES, OR ENVIRONMENTAL CRITERIA
GROUNDWATER	BENZENE
	PAH (CARCINOGENIC)
	PAHS (NONCARCINOGENIC)
SURFACE WATER	ARSENIC
	CHROMIUM (TOTAL)
	COPPER
SOIL	ARSENIC
	BENZENE - LEACHATE CASE
	CHROMIUM (TOTAL)
	- LEACHATE CASE
	PAHS (CARCINOGENIC)
	PAHS (TOTAL)
SEDIMENT	PAH (TOTAL)
	ARSENIC
	CHROMIUM (TOTAL)
	- LEACHATE CASE

	CLEANUP GOALS	RATIONALE FOR CLEANUP GOALS
	UG/LITER	
GROUNDWATER		
BENZENE	5	A
PAH (CARCINOGENIC)	10	B
PAHS (NONCARCINOGENIC)	14,350	C
SURFACE WATER		
ARSENIC	12	D
CHROMIUM (TOTAL)	11	D
COPPER	14	E

	MG/KG	
SOIL		
ARSENIC	94	C,F
BENZENE - LEACHATE CASE	0.005	B
CHROMIUM (TOTAL)		
- LEACHATE CASE	88	G
PAHS (CARCINOGENIC)	2.5	C, H
PAHS (TOTAL)	100	I
SEDIMENT		
	MG/KG	
PAH (TOTAL)	3.0	J
ARSENIC	94	K
CHROMIUM (TOTAL)		
- LEACHATE CASE	88	K

(A) ARAR = MAXIMUM CONTAMINANT LEVEL (MCL)

(B) THE CONTRACT LABORATORY REQUIRED QUANTITATIVE LIMIT (CLRQL) IS PROPOSED SINCE THE CALCULATED RISK ASSESSMENT VALUE IS BELOW ANALYTICAL DETECTION LIMITS. SHOULD THE CLRQL REDUCE WITH TIME AS ANALYTICAL PROCEDURES IMPROVE, THE NEW (LOWER) CLRQL WOULD BECOME THE CLEANUP GOAL.

(C) VALUE DERIVED USING REVERSE RISK ASSESSMENT TECHNIQUES.

(D) ARAR = AMBIENT WATER QUALITY CRITERIA.

(E) THE GOAL REPRESENTS BACKGROUND CONDITIONS SINCE THE AMBIENT WATER QUALITY CRITERIA CONCENTRATION (6.5 UG/1) IS BELOW BACKGROUND.

(F) THE FUTURE USE WORKER SCENARIO IS USED SINCE THIS IS THE MORE LIKELY FUTURE LAND USE AND ARSENIC IS NOT POSING A SIGNIFICANT RISK UNDER CURRENT USE CONDITIONS.

(G) THE GOAL REPRESENTS SITE BACKGROUND CONDITIONS (MAXIMUM OF THE RANGE OBSERVED) SINCE THE CALCULATED RISK ASSESSMENT VALUE IS BELOW BACKGROUND LEVELS.

(H) THE VALUE LISTED REPRESENTS A CURRENT USE SCENARIO SINCE THIS IS MORE CONSERVATIVE THAN THE LEVELS DERIVED FOR THE FUTURE USE WORKER SCENARIO.

(I) VALUE IS BASED ON TYPICAL BACKGROUND CONCENTRATIONS (FROM THE LITERATURE) SINCE THE CALCULATED LEVEL NECESSARY TO PREVENT FUTURE LEACHATE FROM EXCEEDING A HAZARD INDEX OF 1 IN GROUND WATER (60 MG/KG) IS LESS THAN REPRESENTATIVE BACKGROUND CONDITIONS.

(J) CONCENTRATION RESEARCHED BY EFA TO BE PROTECTIVE OF AQUATIC BIOTA.

(K) THE SAME VALUE PROPOSED FOR SOILS IS APPLIED DUE TO A SIMILAR HUMAN EXPOSURE ROUTE, AND LOW EXPECTED IMPACT TO SURFACE WATER ON A VOLUMETRIC BASIS.

TABLE 9
POSSIBLE REMEDIAL TECHNOLOGIES FOR SOIL
AND SEDIMENTS AND GROUNDWATER AND SURFACE WATER

RESPONSE ACTION	TECHNOLOGY
REMOVAL	EXCAVATION
	SEDIMENT DREDGING AND DEWATERING
TREATMENT	ATTENUATION
	WASHING
	FLUSHING
	IMMOBILIZATION
	BIODEGRADATION
	THERMAL PROCESSING
	INCINERATION
CONTAINMENT/	CAPPING
MIGRATION CONTROL	ON-SITE ENCAPSULATION/LANDFILL
	SOLIDIFICATION/STABILIZATION
	VITRIFICATION
	SUBSURFACE BARRIERS
	OFF-SITE LANDFILL

RESPONSE ACTION	TECHNOLOGY
GROUNDWATER AND SURFACE WATER	
COLLECTION	EXTRACTION WELLS
	SUBSURFACE DRAINS
TREATMENT	AIR STRIPPING
	STEAM STRIPPING
	AERATION
	SPRAY IRRIGATION
	VACUUM EXTRACTION
	FLOCCULATION, SEDIMENTATION
	FILTRATION
	ACTIVATED CARBON ADSORPTION
	PRECIPITATION
	ION EXCHANGE
	REVERSE OSMOSIS
DISPOSAL	DISCHARGE TO SURFACE WATER
	PUBLICLY OWNED TREATMENT WORKS
	PLANT AQUIFER RECHARGE.

TABLE 11
DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES
FOR SOILS/SEDIMENTS
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

ALTERNATIVE	TECHNOLOGIES EMPLOYED
1S	NO ACTION NATURAL FLUSHING
2S	EXCAVATE ISOLATED AREAS OF SOIL CONTAMINATION. EXCAVATE/DREDGE SEDIMENTS DEWATER DREDGED SEDIMENTS CAP SOILS AND DEWATERED SEDIMENTS
3S	EXCAVATE/DREDGE SOILS AND SEDIMENTS. WASH EXCAVATED MATERIALS ONSITE WATER SUPPLY SOURCE: A. PURCHASE FROM FAYETTEVILLE PUBLIC WORKS COMMISSION AND TRUCK TO THE SITE. B. PURCHASE FROM A PRIVATE WATER COMPANY AND PIPE TO THE SITE. C. INSTALL AN ON-SITE WELL OUTSIDE THE CONTAMINANT PLUME AREA. REDEPOSIT WASHED SOILS/SEDIMENTS IN THE EXCAVATED AREA
4S	EXCAVATE/DREDGE SOILS/SEDIMENTS DEWATER DREDGED SEDIMENTS THERMAL PROCESS EXCAVATED MATERIALS SOLIDIFY/STABILIZE PROCESSED SOILS/SEDIMENTS AND REDEPOSIT IN THE EXCAVATED AREA.

S DENOTES REMEDIAL ALTERNATIVE FOR SOIL/SEDIMENT.

TABLE 12
DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES
FOR GROUND WATER AND SURFACE WATER
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

ALTERNATIVE	TECHNOLOGIES EMPLOYED
1W	NO ACTION LONG-TERM GROUND WATER MONITORING
2W	GROUND WATER EXTRACTION BY WELL POINTS AND A DEEP WELL FLOCCULATION, SEDIMENTATION, AND FILTRATION (SURFACE AND GROUND WATER) ACTIVATED CARBON ADSORPTION (SURFACE AND GROUND WATER) DISCHARGE TREATED EFFLUENT TO SURFACE WATER (WESTERN DITCH)
3W	GROUND WATER EXTRACTION BY WELL POINTS AND A DEEP WELL FLOCCULATION, SEDIMENTATION, AND FILTRATION (GROUND WATER AND SURFACE WATER) AIR STRIPPING (GROUND WATER) ACTIVATED CARBON ADSORPTION (SURFACE AND GROUND WATER) DISCHARGE TREATED EFFLUENT TO SURFACE WATER (WESTERN DITCH)
4W	GROUND WATER EXTRACTION BY WELL POINTS AND A DEEP WELL GROUND WATER TREATMENT FILTRATION AIR STRIPPING ACTIVATED CARBON ADSORPTION SURFACE WATER TREATMENT PRECIPITATION FLOCCULATION, SEDIMENTATION, AND FILTRATION DISCHARGE TREATED EFFLUENT TO SURFACE WATER (WESTERN DITCH)
5W	GROUND WATER EXTRACTION BY WELL POINTS AND DEEP WELL(S) PRETREATMENT PRECIPITATION (SURFACE AND GROUND WATER) FLOCCULATION, SEDIMENTATION, AND FILTRATION (SURFACE AND GROUND WATER) DISCHARGE TO POTW

W DENOTES REMEDIAL ALTERNATIVE FOR GROUND WATER OR SURFACE WATER.

TABLE 13
DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES
FOR HAZARDOUS MATERIALS, TANKS, AND PIPING
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

MATERIAL	ALTERNATIVES	TECHNOLOGIES EMPLOYED
APPARENT CCA CRYSTALS **	1C	OFFSITE LANDFILL (HAZARDOUS).
ASBESTOS INSULATION ** (ASSUMED)	1A	OFFSITE LANDFILL (NONHAZARDOUS).
SOLIDIFIED SLUDGE	1SS	ONSITE DISPOSAL
	2SS	OFFSITE LANDFILL (HAZARDOUS).
CCA WASTEWATER AND/OR SOLUTION CCA 3% SOLUTION	1L	TREAT WASTEWATER AND ONSITE FOR CR
		TREAT WASTEWATER AND SOLUTION ONSITE WITH SURFACE WATERS
	1L	TREAT WASTEWATER AND SOLUTION OFFSITE.
	3L	TRANSPORT CCA SOLUTION OFFSITE.
TANKS AND PIPING	1T/P + 2T/P	LOCATE (PIPING) EMPTY (TANKS) EXCAVATE (UST AND PIPING) DRAIN/PURGE (PIPING) CLEAN (TANKS AND PIPING) CUT (TANKS AND PIPING)
		DISPOSE OF AS:
	1T/P	SCRAP METAL
	2T/P	AT AN OFFSITE LANDFILL (NONHAZARDOUS)

C DENOTES CRYSTALS (APPARENT CCA)
A DENOTES ASBESTOS (ASSUMED)
SS DENOTES SOLIDIFIED SLUDGE
L DENOTES LIQUID (CCA WASTEWATER AND/OR CCA 3% SOLUTION)
T/P DENOTES TANKS/PIPING

** BASED ON VISUAL CHARACTERIZATION. THESE MATERIALS WERE NOT SAMPLED.
UST - UNDERGROUND STORAGE TANK.

TABLE 18
SUMMARY OF PRESENT WORTH COSTS
FOR HAZARDOUS MATERIALS, TANKS AND PIPING
CAPE FEAR WOOD PRESERVING SITE
FAYETTEVILLE, NORTH CAROLINA

		TOTAL PRESENT WORTH (1) $
1C:	OFF SITE LANDFILL (HAZARDOUS) OF APPARENT CCA CRYSTALS	$ 9,600
1A:	OFF SITE LANDFILL (NONHAZARDOUS) OF ASSUMED ASBESTOS INSULATION	$ 13,500
1SS:	ONSITE DISPOSAL OF SOLIDIFIED SLUDGE	$ 27,700
2SS:	OFFSITE DISPOSAL OF SOLIDIFIED SLUDGE	$ 28,900
1L:	ONSITE TREATMENT OF CCA SOLUTION AND/OR WASTEWATER DISCHARGE TO SURFACE WATER	$104,000
2L:	OFFSITE TRANSPORT AND TREATMENT OF	$126,100
3L:	OFFSITE TRANSPORT OF CCA SOLUTION	$ 25,500
1T/P:	REMOVAL AND CLEANING OF TANKS AND PIPING RECYCLE AS SCRAP (SELL)	($112,400)
2T/P:	REMOVAL AND CLEANING OF TANKS AND PIPING	$ 87,900

(1) THE TOTAL PRESENT WORTH IS BASED ON CAPITAL COSTS SINCE REMEDIATION IS ONE-TIME AND DOES NOT INVOLVE O&M.

($) INDICATES NEGATIVE COSTS = CASH FLOW PAYMENT.